



AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY

WITH INDEXES

(Supplement 126)

MARCH 1974

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Accession numbers cited in this Supplement fall within the following ranges:

STAR (N-10000 Series) N74-11804—N74-13699

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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 126)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in February 1974 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*



Scientific and Technical Information Office
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MARCH 1974

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INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 400 reports, articles and other documents announced during February 1974 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes—subject and personal author—are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1973 Supplements.

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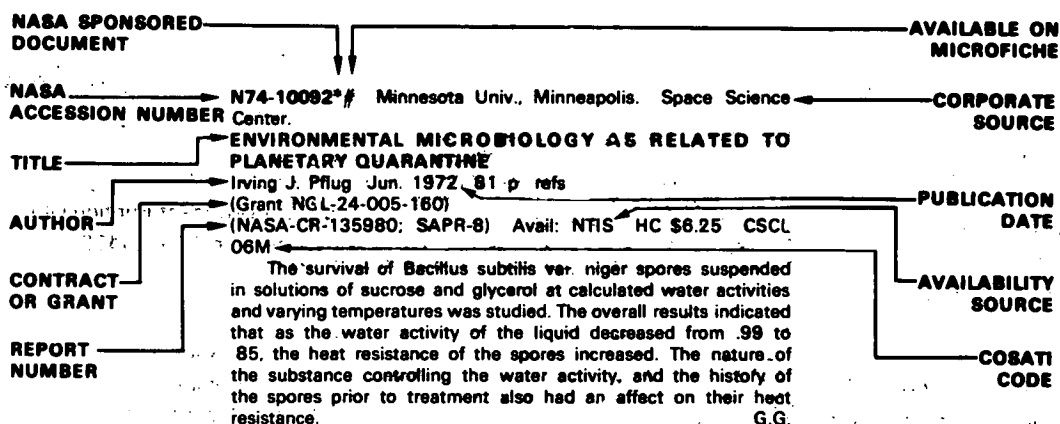
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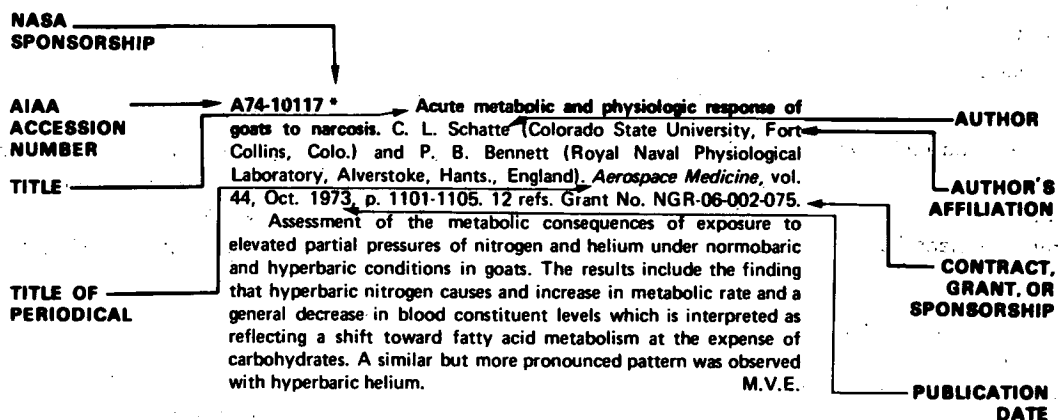
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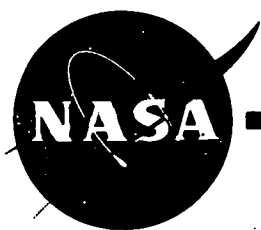
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AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 126)

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IAA ENTRIES

A74-12976 Man under stress; Proceedings of the Ninth Annual Conference, Adelaide, Australia, August 24, 25, 1971. Conference sponsored by the Ergonomics Society of Australia and New Zealand. *Ergonomics*, vol. 16, Sept. 1973. 161 p.

Topics discussed include the effects of stress on performance, the physiological response to auditory and visual stimuli, the effect of physical exertion on mental performance, the effects of exercise on arousal mechanisms, thermal comfort as a measure of thermal stress, the effect of thermal stress on EEG arousal level, a theory of fatigue which allows for cumulative effects over periods of time, and the relation between adrenocortical steroid excretion and sleep patterns as an indication of stress.

A.B.K.

A74-12977 Stress and performance. A. T. Welford (Adelaide, University, Adelaide, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 567-580. 27 refs.

The effects on performance are discussed of various types of stress deriving from imbalance between capacity on the one hand and, on the other, the demands of tasks, environmental conditions and social situations which either overload or underload the individual. Common cybernetic principles seem to apply over an area which includes not only stress, but also motivation and arousal. A model is proposed which ties together three previously existing models current in this field: The Inverted-U Hypothesis, Signal Detection Theory and the Yerkes-Dodson Law. The model is examined further in relation to individual differences of personality and to problems of conserving talent among students and those carrying heavy executive responsibility. (Author)

A74-12978 Physiological response to relevant and irrelevant stimuli in a simple reaction time situation. D. Carroll. (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 587-594. 22 refs.

Simple reaction time to a light was measured under two conditions: (1) with an intense (100 dB) or moderate (60 dB) auditory stimulus always coming 5 sec before the light; and (2) with a random relationship between the times at which the auditory stimuli and lights occurred. Response times showed relationships with a physiological measure of autonomic response. The results are discussed in terms of: (1) orienting and defence reactions to potentially stressful stimuli, and (2) intense auditory stimuli as stressors. (Author)

A74-12979 Physical exertion and mental performance. C. P. Davey (Melbourne, University, Melbourne, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 595-599.

The problem of why people in a state of fatigue make wrong decisions prompted a series of laboratory experiments of which two are described. Subjects pedalled a bicycle ergometer for varying periods of time and were tested for mental performance after different amounts of physical exertion. The results showed that a submaximal amount of physical exertion improved mental performance on the Brown and Poulton test of attention which relies heavily on short term memory. When the exertion was increased over longer periods of time the graph showing the relationship of mental performance to physical exertion followed the form of an inverted U. The evidence suggests that physical exertion affects mental performance by raising the level of arousal. Areas for further research are suggested. (Author)

A74-12980 Anatomical and physiological mechanisms of arousal, with special reference to the effects of exercise. C. J. Cooper (Adelaide, University, Adelaide, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 601-609. 37 refs.

A74-12981 Thermal stress and thermal comfort. R. K. Macpherson (Sydney, University, Sydney, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 611-622. 20 refs.

The factors which determine the level of heat stress and the difficulties inherent in its measurement are discussed. The degree of thermal comfort or discomfort is shown to be a useful measure of thermal stress and methods for the determination of the preferred temperature are described. Objective measures of heat stress such as its interference with sleep and its effect on mortality in the aged are shown to agree with the subjective measure of thermal comfort. Means for the mitigation of heat stress in hot climates are outlined. (Author)

A74-12982 Thermal stress and arousal. K. A. Provins (Australian National University, Canberra, Australia), D. J. Glencross (Flinders University of South Australia, Bedford Park, Australia), and C. J. Cooper (Adelaide, University, Adelaide, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 623-631. 13 refs. Research supported by the Australian Research Grants Committee.

Two series of experiments were carried out to determine the effect of different body temperatures on two measures of EEG arousal level and thermal comfort. In the first study the body temperature was varied systematically within a single experimental session by whole body immersion in a water bath; in the second, the body temperature was maintained at a constant but elevated or depressed level which was varied between sessions. Evidence was obtained which suggested that the arousal level as indicated by both the subjective and EEG records is not determined solely by either the body temperature or ambient conditions but is a resultant of their combined influences. (Author)

A74-12983 **A theory of fatigue.** C. Cameron (Australian Road Research Board, Vermont, Victoria, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 633-648. 39 refs.

Critical review of the historical background of research about fatigue in man, and attempt at formulating a present-day theoretical view on fatigue. The framework of assumptions within which early research was performed is examined, and the weaknesses inherent in much of that early work are made explicit in the three crucial problem areas of fatigue definition, measurement, and interpretation. The changes of emphasis that have occurred over the last fifty years are surveyed. It is shown that much of the difficulty arose from a failure to consider the characteristics of a biological system: fatigue has often been conceptualized in simple energetic terms which are inappropriate when dealing with a complex biological process. In conclusion, a view of fatigue is developed which perhaps falls short of a theory, but permits resolution of the paradoxical results frequently reported in studies of fatigue. M.V.E.

A74-12984 **Stress adrenocortical activity and sleep habits.** M. D. E. Goodyear (Monash University, Clayton, Victoria, Australia). (*Ergonomics Society of Australia and New Zealand, Annual Conference, 9th, Adelaide, Australia, Aug. 24, 25, 1971.*) *Ergonomics*, vol. 16, Sept. 1973, p. 679-681. 8 refs.

It is shown that adrenocortical steroid excretion is related to individual differences in the ability to cope with everyday life and that sleep patterns also seem to reflect that quality. The way a person sleeps may, therefore, offer a useful indication of stress. M.V.E.

A74-13033 **Isomerisation of the visual chromophore all-trans to 11-cis retinal.** B. O'Leary, B. Duke, J. E. Eilers (Oxford University, Oxford, England), and E. W. Abrahamson (Case-Western Reserve University, Cleveland, Ohio). *Nature*, vol. 246, Nov. 16, 1973, p. 166, 167. 7 refs.

Results of a study of all-trans retinal based on simulated ab initio molecular orbital calculations on relatively large 'pattern' molecules. A preferred isomerization of all-trans to 11-cis retinal is found to occur about the C-11 - C-12 bond and is attributed to the weak nature of this bond in the excited triplet state. A.B.K.

A74-13148 # **Modification of mental habits after changing to piloting by command devices (Izmenenie umstvennogo navyka pri perekhode k pilotirovaniyu po direktornym priboram).** N. D. Zavalova and V. A. Ponomarenko. *Voenna-Meditsinskii Zhurnal*, Sept. 1973, p. 54-58. In Russian.

Description of in-flight studies of changes introduced in the innate control habits of pilots by computerized instrumentation and display systems that provide indications of required control functions in command form rather than in the form of flight parameters. Pilots accustomed to flying by interpretation of individual instrument readings are required to form a mental picture of the aircraft in flight and to undertake suitable control measures that will affect the flight status in accordance with a formulated mental flight plan. The presentation of computer-processed flight information in the form of specific control commands to the pilot deprives him of the ability to develop an accurate mental image of the flight status. Tables illustrate cases of control errors committed by pilots after sudden deprivation of computer-processed command displays, requiring reversal to conventional instrument flying in landing and approach tasks. T.M.

A74-13163 **Contour enhancement, short term memory, and constancies in reverberating neural networks.** S. Grossberg (MIT, Cambridge, Mass.). *Studies in Applied Mathematics*, vol. 52, Sept. 1973, p. 213-257. 38 refs. Research supported by the Alfred P. Sloan Foundation; Contract No. N00014-67-A-204-0051.

A model of the nonlinear dynamics of reverberating on-center off-surround networks of nerve cells, or of cell populations, is analyzed. The on-center off-surround anatomy allows patterns to be processed across populations without saturating the populations' response to large inputs. The signals between populations are made sigmoid functions of population activity in order to quench network noise, and yet store sufficiently intense patterns in short term memory (STM). There exists a quenching threshold: a population's activity will be quenched along with network noise if it falls below the threshold; the pattern of suprathreshold population activities is contour enhanced and stored in STM. Varying arousal level can therefore influence which pattern features will be stored. The total suprathreshold activity of the network is carefully regulated.

(Author)

A74-13227 # **Convergence of the synaptic effects of contralateral somatic afferents on the interneurons in segmental inhibitory pathways to motoneurons (Konvergentsiia sinapticheskikh vlianii somaticheskikh afferentov kontralateral'noi storony na vstavochnyykh neuronakh segmentarnykh tormoziaschikh putei k motoneuronam).** V. I. Saf'iants, S. A. Evdokimov, and K. S. Predtechenskaia (Akademiiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Neirofiziologiia*, vol. 5, Sept.-Oct. 1973, p. 476-484. 16 refs. In Russian.

A74-13228 # **Influence of the elimination of visual afferentation on the electrical activity of different brain structures (Vlianie ustraneniia zritel'noi afferentatsii na elektricheskuiu aktivnost' razlichnykh struktur golovnogo mozga).** A. R. Kezeli (Akademiiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tiflis, Georgian SSR). *Neirofiziologiia*, vol. 5, Sept.-Oct. 1973, p. 497-501. 28 refs. In Russian.

A74-13229 # **Reaction of neurons in area 5b of the suprasylvian gyrus to stimulation of the lateral posterior thalamic nucleus (Reaktsiia neuronov polia 5b suprasil'vievoy izviliny na razdrazhenie zadnego lateral'nogo iadra talamusa).** D. P. Artemenko and T. M. Mamonets (Akademiiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR). *Neirofiziologiia*, vol. 5, Sept.-Oct. 1973, p. 502-509. 30 refs. In Russian.

A74-13263 # **Computer program to generate dimensional and inertial properties of the human body.** J. A. Bartz and C. R. Gianotti (Calspan Corp., Buffalo, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, Detroit, Mich., Nov. 11-15, 1973, Paper 73-WA/Bio-3*. 9 p. 23 refs. Members, \$1.00; nonmembers, \$3.00. Research sponsored by the Motor Vehicle Manufacturers Association.

A digital computer program has been developed to calculate dimensional and inertial properties of the human body. The program has been designed so that the user may either select a data set from a program library, or compute a data set from a geometric man-model. From primary program inputs of sex, standing height, seated height, and weight, the routines compute body segment link lengths, contact surface dimensions, masses, and moments of inertia from inputted sets of anthropometric data. Overall validity of the formulation and techniques has been established by comparing computed results with measurements on the human body reported by various investigators.

(Author)

A74-13264 * # **Analytical prediction of the heat transfer from a blood vessel near the skin surface cooled by a symmetrical strip.** J. C. Chato (Illinois, University, Urbana, Ill.) and A. Shitzer (Technion - Israel Institute of Technology, Haifa, Israel). *American Society of Mechanical Engineers, Winter Annual Meeting, Detroit, Mich., Nov. 11-15, 1973, Paper 73-WA/Bio-7*. 5 p. 5 refs. Members, \$1.00; nonmembers, \$3.00. Grant No. NGR-14-005-103.

A74-13265 # **The role of articular facets during +Gz acceleration.** P. Prasad, A. I. King (Wayne State University, Detroit,

Mich.), and C. L. Ewing (U.S. Naval Aerospace Medical Research Laboratory, New Orleans, La.). *American Society of Mechanical Engineers, Winter Annual Meeting, Detroit, Mich., Nov. 11-15, 1973, Paper 73-WA/Bio-31*. 14 p. 12 refs. Members, \$1.00; nonmembers, \$3.00. Contract No. N00014-69-A-0235-0001.

Experimental evidence is presented to document the load-bearing capability of the articular facets which join the vertebrae of the spine together posteriorly. Contrary to the general opinion that these facets carry no vertical load, this paper gives qualitative as well as quantitative data to show that there exists a dual load path along the vertebral column. Extensively instrumented human cadavers were used as test subjects. Strain gages were used to provide qualitative evidence of facet load while a unique intervertebral load cell supplied quantitative information of the load-bearing role of the facets. The results of this study led to a clearer understanding of the mechanism of injury to the vertebral column during +Gz impact acceleration.

(Author)

A74-13307 * # Heating of foods in space-vehicle environments. R. B. Bannerot, J. E. Cox, C. K. Chen (Houston, University, Houston, Tex.), and N. D. Heidelbaugh (NASA, Johnson Space Center, Houston, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, Detroit, Mich., Nov. 11-15, 1973, Paper 73-WA/HT-15*. 13 p. 9 refs. Members, \$1.00; nonmembers, \$3.00. Contract No. NAS9-11676.

In extended space missions, foods will be heated to enhance the psychological as well as the physiological well-being of the crew. In the low-gravity space environment natural convection is essentially absent so that the heat transfer within the food is by conduction alone. To prevent boiling in reduced pressure environments the maximum temperature of the heating system is severely limited. The Skylab food-heating system utilizes a tray with receptacles for the food containers. The walls of the receptacles are lined with thermally controlled, electrical-resistance, blanket-type heating elements. A finite difference model is employed to perform parametric studies on the food-heating system. The effects on heating time of the (1) thermophysical properties of the food, (2) heater power level, (3) initial food temperatures, (4) container geometry, and (5) heater control temperature are presented graphically. The optimal heater power level and container geometry are determined.

(Author)

A74-13313 Aviation psychological research. Edited by J. D. Anderson. Brussels, Western-European Association for Aviation-Psychology, 1973. 103 p. In English, French, and German. \$5.40.

The human factor in flight safety is discussed together with the perceptual defense organization as predictor of the pilot's adaptive behavior in military flying, the personality variables of airline pilots, and flight simulator research at the Royal Air Force Institute of Aviation Medicine. Other topics explored include student and instructor attitude to the simulator, the quantitative evaluation of aircraft flight simulators, the selection of fighter controllers, and aspects of management training in an international airline.

G.R.

A74-13314 # The effects of DPH on cognitive efficiency in pilots. L. R. C. Hayward (Graylingwell Hospital, Hants., England). In: Aviation psychological research. Brussels,

Western-European Association for Aviation-Psychology, 1973, 5 p.

The study is concerned with the intellectual capacity of pilots, and was undertaken when they are working at their maximum channel capacity. The study on DPH (sodium diphenyl hydantoinate) is of importance because DPH offers a way of improving intellectual efficiency without having any of the disadvantages that are known to occur when stimulant drugs are used. A factor of interest about DPH is that it corrects the adrenalin level and brings it closer to the norm.

F.R.L.

A74-13315 # Perceptual defense organisation as a predictor of the pilot's adaptive behaviour in military flying. T. Neuman (Institute of Military Psychology, Stockholm, Sweden). In: Aviation

psychological research. Brussels, Western-European Association for Aviation-Psychology, 1973. 8 p.

A general survey is given of the main aspects and the results so far obtained of the strivings to transform a clinical projective test into a purely actuarial method. The Defense Mechanism Test (DMT) is a projective personality test, which utilizes signs of perceptual defense structures indicating the perceptual defense organization (PDO), i.e., the constellation of defense and coping mechanisms. The DMT is applied as the last step in a new selection system for pilots. The new selection procedure has changed the pass/fail proportion from 40/60 to 60/40.

F.R.L.

A74-13316 # The quantitative evaluation of aircraft flight simulators. I. D. Fauset (Ministry of Defence, London, England). In: Aviation psychological research. Brussels,

Western-European Association for Aviation-Psychology, 1973. 5 p.

The progress which has been made to date is reviewed, and the program for future research into the value of flight simulators in the Royal Air Force is outlined. Two main factors have combined to make necessary a more objective approach in assessing the value of simulators. The first factor is that as front line aircraft have become more complicated the costs per flying hour have risen alarmingly and at the same time aircrew are needing more flying to achieve operational efficiency. The second factor is that simulator technology has made considerable advances in recent years. Subjective and objective performance assessment are considered, and future proposals are examined.

F.R.L.

A74-13317 # The causes of failure in pilot school. (Les causes d'échec en école de pilotage). R. Gelly (Ministère des Armées /Air/, Paris, France). In: Aviation psychological research.

Brussels, Western-European Association for Aviation-Psychology, 1973. 9 p. In French.

The study of failures in flying school shows that behind the many apparent causes and clinical tables, there appears to be a common factor characterized as a diffuse distress which can manifest itself or convert itself into somatic troubles in deterioration of sensory-motor performances or in loss of motivation. Several theories which have been proposed to explain the fear of flight are briefly discussed, and some practical consequences are indicated. The pathology of the student pilot, over all, can be understood as a group of phenomena which accompany the process of passage which corresponds to an important stage of the psychological maturation.

F.R.L.

A74-13318 # The formalization of decision processes in psychological selection procedures (Zur Formalisierung von Entscheidungsprozessen in psychologischen Auswahlverfahren). A. Waltert (Swissair AG, Schweizerische Luftverkehrsschule, Zurich, Switzerland). In: Aviation psychological research.

Brussels, Western-European Association for Aviation-Psychology, 1973. 19 p. In German.

An experiment conducted at the Swiss aviation school in connection with the selection of candidates for the career of a pilot is reported. The selection procedure has the objective to find about 20 suitable students for the aviation school among approximately 500 applicants. The selection procedure has five stages including an administrative preselection process, a series of written tests, an examination consisting of an interview and two tests with special devices related to the piloting of an aircraft, and a two-week course involving instructions in flying. The fifth stage involves a medical examination, two interviews, a Rorschach test, and a graphological evaluation.

G.R.

A74-13319 # The selection of fighter controllers. A. G. Parfitt (RAF, London, England). In: Aviation psychological research.

Brussels, Western-European Association for Aviation-Psychology, 1973. 7 p.

The basic task description of the fighter controller is observation of an air defence area together with the guiding of aircraft in

interception missions. With the increasing performance of modern aircraft and the advent of computer assisted techniques, it is likely that additional selection measures could profitably be employed. Controllers are drawn (1) directly from civil life, (2) from among pilots and other aircrew who are temporarily or permanently withdrawn from flying duties, and (3) from tradesmen from the air defense operating trades. All candidates undergo a basic training course covering the theory of air defence and interception controlling, in addition to ancillary subjects such as meteorology and navigation, plus periods of simulated and 'live' controlling. F.R.L.

A74-13460 # Mechanical variations of oxygen pressure in relation to the biological conditions inside a flight cabin (Variatiile mecanice de presiune a oxigenului in corelatie cu conditiile biologice din interiorul unei cabine de zbor). D. Rugescu, L. Ionescu-Ghermanescu, and M. D. Nicu (Bucuresti, Institutul Politehnic Gheorghe Gheorghiu-Dej; Observatorul Astronomic, Bucharest, Rumania). *Studii si Cercetari de Astronomie*, vol. 18, no. 2, 1973, p. 223-226. 6 refs. In Rumanian.

A74-13526 Influence of deafferentation of the medial basal hypothalamus on the sensitivity of the brain to hyperbaric oxygen. D. Harel, N. Conforti, and S. Lavy (Jerusalem, Hebrew University, Jerusalem; Ministry of Defence, Tel Aviv, Israel). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1223-1226. 31 refs.

A74-13527 * Estimates of fluid and energy balances of Apollo 17. P. C. Johnson (Baylor College; Methodist Hospital, Houston, Tex.), C. S. Leach, and P. C. Rambaut (NASA, Johnson Space Center, Houston, Tex.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1227-1230. 15 refs. Contracts No. NAS9-11201; No. NAS9-7280; Grant No. NIH-HE-05435-11.

Fluid and caloric balance has been calculated for the Apollo 17 crew. This included measurement of nitrogen, water, and caloric value of the ingested food and the volume and nitrogen content of the excreted urine and feces. Body composition changes were determined from total body water and extracellular fluid volume differences. The body composition measurements made it possible to divide the weight loss into lean body mass and adipose tissue losses. From this division a caloric equivalent was calculated. These tissue losses indicated that the caloric requirements of the mission were considerably greater than the actual caloric intake. The 3.3 kilo mean loss of body weight represented 1 kilo of lean body mass and 2.3 kilos of adipose tissue. Calculated fluid balance was more positive during the mission than during the control period. These changes are unlike the body composition and fluid balance changes reported in bedrested subjects. (Author)

A74-13528 Cardiovascular changes in anesthetized dogs at 3 and 5 atmospheres absolute pressure. E. Hardenbergh, R. G. Buckles, J. A. Miles, Jr., P. W. Schilling, and J. B. Eckenhoff (National Naval Medical Center, Naval Medical Research Institute, Bethesda, Md.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1231-1235. 17 refs. Navy-supported research. Navy Task M4306,02-2070BAK9.

A74-13529 Characteristics of eye movements to targets of short duration. G. R. Barnes and M. A. Gresty (RAF, Institute of Aviation Medicine, Farnborough, Hants., England). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1236-1240. 13 refs.

Subjects were required to fixate on visual targets, briefly illuminated (1-400 msec) which appeared 10 and 20 deg left and right of center on a horizontal curved screen. Then, 800 msec after the flash the target light reappeared so that fixation could be calibrated and errors estimated. Eye movement responses consisted of a large saccade toward the target sometimes followed by smaller corrective movements, all executed in the absence of a visual signal. Accuracy of eye movements was high (95%) and almost unrelated to

target duration or position. The corrective eye movements resulted in the direction of fixation being more accurately aligned with the target direction. It is inferred that information must have been available relating the original retinal error and starting eye position to subsequent eye displacements and, hence, that there is an accurate (unconscious) sense of eye position in this situation. (Author)

A74-13530 * Landing performance by low-time private pilots after the sudden loss of binocular vision - Cyclops II: C. E. Lewis, Jr., R. Swaroop, T. C. McMurty (NASA, Flight Research Center, Edwards, Calif.), W. R. Bläkeley (New Mexico, University, Albuquerque, N. Mex.), and R. L. Masters (Lovelace Foundation For Medical Education and Research, Albuquerque, N. Mex.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1241-1245.

Study of low-time general aviation pilots, who, in a series of spot landings, were suddenly deprived of binocular vision by patching either eye on the downwind leg of a standard, closed traffic pattern. Data collected during these landings were compared with control data from landings flown with normal vision during the same flight. The sequence of patching and the mix of control and monocular landings were randomized to minimize the effect of learning. No decrease in performance was observed during landings with vision restricted to one eye, in fact, performance improved. This observation is reported at a high level of confidence (p less than 0.001). These findings confirm the previous work of Lewis and Krier and have important implications with regard to aeromedical certification standards. (Author)

A74-13531 Changes in the rabbit electroretinogram c-wave following ruby laser insult. L. A. Priebe and A. J. Welch (Texas, University, Austin, Tex.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1246-1250. 13 refs. Contracts No. F44620-71-C-0091; No. F41609-71-C-0001.

This study was conducted to compare changes in the electroretinogram c-wave following ruby laser insult with the threshold for ophthalmoscopically visible lesions. Dark adapted, pigmented rabbits were used as experimental subjects. A corneal ring electrode was used to monitor the electroretinogram. The experimental procedure included recording the preburn responses which were evoked by a 27.5-microjoule argon stimulus, exposing the retina to ruby laser radiation, and recording the postburn responses immediately post-burn and at 30-min intervals for 1 hour postinsult. The data show an increase in c-wave amplitude for ruby energies from approximately 75 to 300% of the ophthalmoscopic threshold. The amplitude decreased above 300% threshold. The increases in c-wave amplitude are thought to be caused by increased transretinal potassium flux. The decreases in c-wave amplitude may be caused by decreased potassium flux following pigment epithelial cell death. (Author)

A74-13532 * Frequency-dependence of dynamic lung compliance during acute exposures to an altitude of 3,962 meters. A. Nicogossian (NASA, Johnson Space Center, Houston, Tex.), R. Bason, C. E. Billings, D. H. Stevens, and T. Ault (Ohio State University, Columbus, Ohio). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1251-1254. 28 refs.

A74-13533 Effectivity of antimotion sickness drugs during artificial gravity simulations. J. A. Green (Rockwell International Corp., Downey, Calif.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1255-1260. 21 refs.

Selected antimotion sickness drugs were evaluated in a simulated artificial gravity environment. Coded capsules, containing Scopamine/Dexedrine, Promethazine/Ephedrine, Dramamine, or a placebo, were administered, using the double-blind technique. The test subjects were rotated at 6 rpm and at radii to 80 ft. Measurements of cognitive functions, psychomotor performance, and degrees of motion sickness were obtained. The drugs were effective in modifying the response to the rotational stimuli, with the Promethazine/Ephedrine being most beneficial. However, this and the

Scopolamine/Dexedrine formulations appeared to adversely affect short-term memory and problem-solving functions. There were no measureable effects on the majority of the psychomotor test evaluations. (Author)

A74-13534 Fast Fourier transform analysis of the circadian rhythm of urinary 11-hydroxycorticosteroids in laboratory rats exposed to high environmental pressures of helium and oxygen. R. A. Bitter, J. Hootman, and T. W. Nielsen (North Dakota, University, Grand Forks, N. Dak.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1261-1263. 11 refs. Contract No. N00014-68-A-0499. NR Project 101-753.

A74-13535 * Caloric balance during simulated and actual space flight. P. C. Rambaut, N. D. Heidelbaugh, M. C. Smith, Jr. (NASA, Johnson Space Center, Biomedical Research Div., Houston, Tex.), and J. M. Reid (National Institutes of Health, Bethesda, Md.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1264-1269. 23 refs.

The in-flight caloric intakes of all Apollo astronauts are examined and shown to average about 25 kcal per kg per day. Measurement of weight changes following recovery indicates that about 0.15 kg of fat was lost per man per day in-flight for an average deficit of about 19 kcal per kg per day. Measurement of the caloric intake of astronauts under ground-based conditions and during hypobaric exposure indicated a caloric requirement which was not significantly different from the in-flight requirement adjusted for weight loss. Partial metabolic balance data and measurements of bone loss and body volume revealed that protein and mineral losses also occurred to an extent which would reduce the size of estimated in-flight caloric deficits. (Author)

A74-13536 Normal posture of spine determined by mathematical and statistical methods. A. Beck (Bundesministerium der Verteidigung, Luftwaffe, Flugmedizinisches Institut, Fürstentfeldbruck, West Germany) and J. Killus (München, Technische Universität, Munich, West Germany). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1277-1281. 11 refs.

To exclude subjective components in quantitations of spinal posture, a system of cartesian coordinates was applied for measuring spinal columns in two planes. The abscissa is directed from S1 to Th1 and divided in 33 equidistant points. The origin lies in the lumbosacral hinge. The ordinate is measured to the midline drawn through the vertebral bodies. The sacrum is evaluated separately in 12 equidistant points. In this way, a standardization of the dorsolumbar spine and sacrum is obtained. Standardizations, just as all other calculations, are accomplished by digital computer. With the aid of 68 data (segments and angles) it was possible to give an exact description of every spinal column in one plane. Expected values with tolerance limits for all 68 data were determined. Nearly all of the 68 data show normal distribution. Only one ideal type of spinal column could be shown by these findings. There was no evidence for the presence of several different constitutional posture types. (Author)

A74-13537 Intracolonic oxygen tension and in vivo bactericidal effect of hyperbaric oxygen on rat colonic flora. G. H. Bornside, G. W. Cherry, and M. B. Myers (Louisiana State University, New Orleans, La.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1282-1286. 11 refs. Contract No. N00014-66-C-0189; Grant No. NIH-5-R01-HL-14772-02.

A74-13538 Fifteen-year survey of pilots returned to flying status following a myocardial infarction. U. A. G. Sexton and R. L. Wick, Jr. (Ohio State University, Columbus, Ohio). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1287-1289. 6 refs.

A74-13539 Comparison of visual acuity tests and viewing condition interactions. P. J. Spicer and F. J. Ensell (British Aircraft Corp., Ltd., Filton, Bristol, England). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1290-1294. 9 refs. Ministry of Technology Contract No. KV/B/813/CB64B.

This study has sought to compare a laboratory-controlled test of visual acuity against a mechanical mass vision screener and standard Snellen charts as are available to ordinary medical practitioners. We would suggest that the results show that the mass screener and the Snellen charts are adequate as far as the normal requirements for vision are concerned. This study has further investigated the inter-relationship of observers, contrast, brightness, and background. The results confirm previous work which has indicated that contrast and brightness are the most significant factors. Contrast would, however, appear to be the dominant factor. (Author)

A74-13540 Cockpit design - Pilot accommodation and accessibility to controls. M. I. Bullock (Queensland, University, Brisbane, Australia). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1295-1299. 5 refs.

As part of a project concerned with the determination of arm reach boundaries for placement of manual controls within a cockpit, a questionnaire was distributed to a random sample of Australian male and female pilots of light aircraft. This survey was undertaken for the purpose of gathering supplementary information on the pilots' accommodation and accessibility to controls. Analysis of the responses revealed that, as well as the discomfort experienced in their accommodation, some pilots have definite reaching problems within their cockpits. Certain light aircraft appear to be at fault in this regard more often than others. Therefore, tables have been presented to demonstrate the frequency of such problems within the cockpits of the various light aircraft used by the pilots in this survey. The facts which have emerged from the questionnaire analysis indicate that some modifications to the aircraft or to its installations need to be made to ensure the provision of safe restraint for pilots while allowing them to reach all controls. (Author)

A74-13541 Recurrent urinary tract calculi possibly due to inherited cystathioninuria. G. W. Frimpter (Texas, University; Health Science Center, San Antonio, Tex.). *Aerospace Medicine*, vol. 44, Nov. 1973, p. 1300, 1301. 9 refs.

A 33-year old airman with recurrent urinary tract calculi was found to have the inherited metabolic disorder cystathioninuria. Like other patients with this aminoaciduria he responded to high doses of vitamin B sub 6 by a marked reduction in excretion of the amino acid. There was a three-fold increase in hydrogen ion excretion and relief from stone formation over a brief period. Although both the mechanism of stone formation as being related to an inadequately acid urine and the beneficial effect of therapy are unproven, it is suggested that chromatography of urine for abnormal amino acid concentrations is indicated in stone problems. (Author)

A74-13557 * Spacecraft oxygen recovery system. P. D. Quattrone (NASA, Ames Research Center, Moffett Field, Calif.). *Astronautica Acta*, vol. 18, Oct. 1973, p. 261-272. 20 refs. Contracts No. NAS2-6118; No. NAS2-4444.

A system which uses an electrochemical carbon dioxide concentrator to remove carbon dioxide from the cabin atmosphere and a Sabatier reactor to reduce carbon dioxide with hydrogen to form methane and water is described. Oxygen is recovered from water by means of a static-feed water electrolysis system. The hydrogen thus generated is reused in the carbon dioxide concentrator. The methane is a system byproduct. The CO₂ removal reactions and the implementation of the CO₂ concentration concept are discussed, and test results are examined. V.P.

A74-13610 Oscillation of cyclic adenosine monophosphate concentration during the myocardial contraction cycle. G. Brooker (Virginia, University, Charlottesville, Va.). *Science*, vol. 182,

Nov. 30, 1973, p. 933, 934. 19 refs. Grant No. NIH-R01-HL-15985-01.

Evidence is presented that myocardial adenosine 3',5'-monophosphate (cyclic AMP) concentrations oscillate during each myocardial contraction and that this oscillation is altered in the presence of epinephrine. These findings suggest that cyclic AMP could regulate normal and hormone-induced changes in myocardial contractility by regulating myocardial calcium metabolism. G.R.

A74-13709 * Sterols of the fungi - Distribution and biosynthesis. J. D. Weete (Lunar Science Institute, Houston, Tex.). *Phytochemistry*, vol. 12, 1973, p. 1843-1864. 181 refs. Contracts No. NSR-09-051-001; No. NAS9-12622.

The importance of sterols in the growth and reproduction in fungi is becoming increasingly apparent. This article concerns the composition and biosynthesis of ergosterol in these organisms. Comparison to plant and animal sterol formation are made. (Author)

A74-13717 * Origin of the cell - Experiments and premises. S. W. Fox (Miami, University, Coral Gables, Fla.). *Naturwissenschaften*, vol. 60, 1973, p. 359-368. 83 refs. Grant No. NGR-10-007-008.

Theories and component concepts of the origin of life, i.e., primordial life, have emerged from (1) constructionist studies on model materials and systems, and (2) reductionist studies of contemporary cells. The resultant views conflict in a number of aspects; many of the differences are analyzed in this article. Constructionist experiments are appropriate to asking questions about origins since they are in the same direction as evolution itself. These experiments have revealed self-ordering properties and associated emergent functions, which were not predictable. (Author)

A74-13720 International Congress on Aeronautical and Space Medicine, 20th, Nice, France, September 18-21, 1972, Proceedings (Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, September 18-21, 1972, Proceedings). Congress sponsored by the Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques. *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973. 230 p. In French and English.

The U.S. view of human problems to be addressed for long duration space flights, the study of alimentary comportment in an aviation environment, and the effects of hypoxia on performance are studied. Air motion sickness and decompression sickness are discussed, and a quantitative study is made of habituation to the orbital condition by several days' recording of the single neuron's activity. The effects of anti-g suit inflation on the cardiac output of seated subjects is treated. Psychophysiological problems of long-duration space flight, cardiac and respiratory problems, psychotherapy, physical energy expenditure, sleep patterns, and metabolism are among the additional subjects receiving attention.

F.R.L.

A74-13721 * U.S. view of human problems to be addressed for long duration space flights. C. A. Berry (NASA, Washington, D.C.). (Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 225-233. 12 refs.

The Russian and American space programs have consisted of several thousands of hours of exposure of man to the space environment. In spite of numerous biological phenomena of adaptation observed, the space travellers have displayed, after their return, no enduring pathological effect. Although the usable data remain too limited to reflect fully the effects of space flight, it is possible to sketch the biological responses in the absence of gravity and to define the work bases for the future. Beyond its basic physiological

effects, weightlessness has operational consequences in the daily life of the astronauts. These consequences will be still more evident during missions of long duration. The conclusions drawn in flight as well as on the ground are reviewed, and future requirements concerning prolonged flights are outlined. The gaps in actual knowledge are discussed and solutions are suggested. The problems of habitability are considered, particularly those which remain, at present without satisfactory solutions: psychological responses to a confined life, cleaning, hygiene, and used material. F.R.L.

A74-13722 Study of magnesium metabolism in parasitic colonopathy in aircrew (Etude du métabolisme magnésique dans les colopathies parasitaires du personnel navigant). P. Pesquies, R. Pannier, R. Bon, F.-X. Girod, and J.-C. Hadni (Centre de Recherches de Médecine Aéronautique, Paris, France). (Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 234-236. In French.

A74-13723 Study of alimentary behavior in the aeronautical environment (Etude du comportement alimentaire en milieu aéronautique). P. M. Pingannaud, R. Carre, and P. Pesquies (Ministère des Armées (Air), Service de Santé, Paris, France). (Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 237-239. 7 refs. In French.

In order to determine the outstanding features in the alimentary habits of aircrew, a survey was carried out among civil and military pilots during their medical examinations. More than 500 questionnaires were analyzed. In general, it was found that eating habits remained substantially what they were at home, in spite of irregular working hours. On the basis of this survey dealing with the quantitative and qualitative aspect of food, as well as certain motivations it was possible to evaluate, with these population samples, the current trends in eating habits. F.R.L.

A74-13724 The effects of mild hypoxia on performance. M. F. Allnutt, R. G. Green, and R. A. Edenborough (RAF, Institute of Aviation Medicine, Farnborough, Hants., England). (Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 240-242. 10 refs.

Tests were carried out on 16 aircrew, each of whom performed two experimental runs at simulated altitudes of 10,000, 8000, 6000, 4000, and 0 feet. Each subject performed at each altitude in random order, and then again at each altitude, also in random order. Tests were made for short term memory, attention, calculation ability, and decision making. The results clearly fail to establish or confirm any change in physiological performance at the altitudes used in this experiment. It is therefore concluded that current levels of aircraft pressurization are adequate to maintain a satisfactory level of performance. F.R.L.

A74-13725 Cardio-vascular and humoral reactions to hypoxia in flying personnel with signs of cardio-vascular pathology. B. L. Gelman, G. L. Strongin, L. I. Kuznetsova, N. B. Makarova, I. V. Mikhailova, and E. M. Peshkov (Aeroflot, Moscow, USSR). (Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 243, 244.

A74-13726 Study of the effectiveness and the secondary effects of several substances for the prevention of motion sickness (Etude de l'efficacité et des effets secondaires de plusieurs substances antinaupathiques). P. Galban, M. Gouars, and M. Guillermin (Laboratoire d'Etudes Médico-Physiologiques, Mont-de-Marsan, Landes, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 245-247. In French.

A74-13727 Newer concepts on the mechanism and prevention of decompression sickness. C. Chrysanthou, F. Teichner, G. Goldstein, and W. Antopol (New York, City University; Beth Israel Medical Center, New York, N.Y.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 248, 249. 8 refs. Research supported by the Charles H. Silver Fund, Saul Singer Foundation, and Lenore Weinstein Fund; Contract No. N00014-68-A-0393. NR Project 101-735.

A74-13728 The impact of the OFO-A vestibular experiment on space biology - The quantitative study of the habituation to the orbital condition made possible by several days recording of the single neurons activity. T. Gualtierotti, F. Bracchi, and E. Rocca (Milano, Università; CNR, Milan, Italy). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 252-255.

A74-13729 Transportation of sick and injured passengers in commercial aircraft. E. T. Carter (Mayo Clinic, Rochester, Minn.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 256-259.

The transportation of the sick or injured must be carried out in such a fashion as to avoid interference with motion of all other passengers in the aircraft, particularly in event of an emergency. The major effect of importance is the fall in ambient pressure from 760 to 560 mm Hg, which alters the inspired and alveolar oxygen tensions. Accordingly the arterial blood oxygen saturation is reduced from 98 per cent to an average of 91 per cent at an altitude of 2500 m. Experience indicates that a significant in-flight medical disability occurs very rarely, hence the convenience and safety of commercial air travel with respect to the sick and injured seems amply demonstrated. F.R.L.

A74-13731 Anti-G suit inflation on cardiac output of seated subjects. M. A. Sackner and R. Dougherty (Mount Sinai Medical Center, Miami Beach, Fla.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 264-266. 6 refs.

The cardiac output of 10 normal men was measured by a nonbleeding plethysmographic method with nitrous oxide, making possible an estimation of transitory variations of the cardiac output. Inflation of the G-suit in the reclining position increases the venous return as is shown by the increase of the cardiac output when the subject is returned to the seated position. The anti-G suit could

probably be improved by an inverse inflation toward the top, starting from the calves toward the abdomen. A better protection against positive-G accelerations could also be achieved by preinflation. F.R.L.

A74-13732 Control of breathable liquid oxygen - Measuring the impurities (Contrôle de l'oxygène liquide respirable - Dosage de ses impuretés). R. Falet, J.-P. Chevrier, J.-P. Apouey, A. Fittes-Pucheu, and G. Lavigne (Laboratoire d'Etudes Médico-Physiologiques, Mont-de-Marsan, Landes, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 267-271. In French.

An analytical technique is described which makes use of chromatography in the gaseous phase. It is applied in two steps: live analysis for methane, and analysis after prior refrigerated concentration for other hydrocarbons. This technique, which is sensitive and accurate but lengthy to apply, does not lend itself well to the systematic sampling required for compliance with safety standards. It is consequently necessary to use a sampling technique by making a refrigerated mini-concentration at a sampling loop point. It is shown that the modified technique is suitable for monitoring of liquid oxygen in systematic examinations. F.R.L.

A74-13733 Electrogastro-enterography - Possibility of application in aviation and space medicine (L'Electrogastro-entérogaphie - Possibilité d'application en médecine aéronautique et spatiale). A. Martin, J.-M. Masson, J. Moline, and J.-L. Thillier (Tours, Université, Tours, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 272-275. 9 refs. In French.

A74-13734 Physiological reactions of human subjects to infrasounds (Réactions physiologiques de sujets humains exposés à des infra-sons). P. Borredon (Centre de Recherches de Médecine Aéronautique, Paris, France) and J. Nathie (Centre Principal d'Expertise Médicale du Personnel Navigant, Paris, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 276-279. 7 refs. In French.

Forty two young men were exposed for 50 min to mechanical sinusoidal air vibrations with a frequency of 7.5 Hz and a level of 130 dB (2.10×10 to the minus 5 power/sq m). The testing device consisted of a rigid caisson, one of the vertical sides of which was fitted with a mobile panel operated by a hydraulic jack. Inside the caisson the subject was isolated from the vibration transmitted by the walls. A study was made of the effects of 'infrasound treatment' on response time to a light signal, maximum humeral blood pressure, and cardiac frequency. There was a discrete but significant augmentation of the minimal arterial pressure taken by the auscultation method. F.R.L.

A74-13735 Psychophysiological problems of long-duration space flight. N. V. Krylova, B. F. Lomov, and V. A. Popov. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 280, 281.

A74-13736 Validation of a rheoplethysmographic method of measuring cardiac output used in the study of aerospace aggressions (Validation d'une méthode rhéoplethysmographique de mesure du débit cardiaque utilisée dans l'étude des agressions aérospatiales). J. Demange, J. Pernod, G. Hagenauer, and J. Colin (Laboratoire de Médecine Aérospatiale, Brétigny-sur-Orge, Essonne; Ministère des Armées, Service de Cardiologie des Armées, Clamart, Hauts-de-Seine, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 282, 283. In French.

A74-13737 The psychosocial reconstruction inventory - A postdictal instrument in aircraft accident investigation. R. E. Yanowitch, S. R. Mohler, and E. A. Nichols (FAA, Office of Aviation Medicine, Washington, D.C.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 292-295.

A74-13738 Personality factors affecting motivation and selection for flying and continued flight proficiency. R. L. Christy, Jr. (U.S. Navy, Washington, D.C.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 296-298. 8 refs.

A74-13739 Psychologic and psychopathologic aspects of behavior during airline pilot transition training. L. G. Lederer (American Airlines, Inc., New York, N.Y.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 299, 300.

A74-13740 * Advance techniques for monitoring human tolerance to positive Gz accelerations. R. Pelligra, H. Sandler, S. Rositano, K. Skrettingland (NASA, Ames Research Center, Moffett Field, Calif.), and R. Mancini (Santa Clara, University, Santa Clara, Calif.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 301-304.

Tolerance to positive g accelerations was measured in ten normal male subjects using both standard and advanced techniques. In addition to routine electrocardiogram, heart rate, respiratory rate, and infrared television, monitoring techniques during acceleration exposure included measurement of peripheral vision loss, noninvasive temporal, brachial, and/or radial arterial blood flow, and automatic measurement of indirect systolic and diastolic blood pressure at 60-sec intervals. Although brachial and radial arterial flow measurements reflected significant cardiovascular changes during and after acceleration, they were inconsistent indices of the onset of grayout or blackout. Temporal arterial blood flow, however, showed a high correlation with subjective peripheral light loss. F.R.L.

A74-13742 Psychotherapy of flight crew members (Psychothérapie des membres du personnel navigant). R. Gelly and J. R. Galle-Tessonneau (Ministère des Armées / Air, Centre Médical de Psychologie Clinique, Paris, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 305-307. 15 refs.

logie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 309-311. In French.

Evaluation of the efficiency of psychotherapeutic treatment of crew members suffering from acute reaction syndromes. The method employed in this case calls for highly concentrated therapy over a short period of time in an effort to achieve readaptation of the patient rather than reconversion. It is tentatively concluded that the proposed method has satisfactory efficiency, since 50 per cent of the treatments produce an appreciable improvement, in most cases after failure of classical medical treatment and psychotropic chemotherapy. A.B.K.

A74-13743 Evaluation of the tissue electrolytic situation by the ratio of overall impedances of the human body at low and high frequencies (Appréciation de la situation électrolytique tissulaire par le rapport des impédances globales du corps humain en basse et haute fréquence). A. Thomasset (Clinique Mutualiste, Lyons, France), J. Lenoir, M. P. Jenin, C. Rouillet (Lyon, Université, Lyons, France), and M. H. Ducrot (Hôpital Necker, Paris, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 312-315. 13 refs. In French.

A74-13744 Advantages of floating microcatheterization in evaluating the respiratory function (Intérêt du microcathétérisme flottant dans le bilan fonctionnel respiratoire). J. Fabre, G. Courcoux, J. L. Hauttemment, and M. Collet (Centre Hospitalier Universitaire, Caen, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 316-318. In French.

Review of the advantages of the floating microcatheterization technique in revealing early signs of repercussion of a pulmonary affection on cardiac activity. In this technique a fine plastic catheter is introduced into the vena basilica and is entrained toward the right side of the heart and the pulmonary artery. The operation can be performed without radiological monitoring with the aid of simple equipment; all risk of false routing or cardiac perforation is eliminated. Apart from some ventricular extrasystoles, the passage of a microcatheter creates no noticeable cardiac arrhythmia. The method is almost completely innocuous and does not require hospitalization of the subject. A.B.K.

A74-13745 Future trends in space immunology and microbiology. Iu. G. Nefedov, I. V. Konstantinova, S. N. Zaloguev, and V. M. Shilov. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 319-321. 15 refs.

One of the major problems for the conduction of long-duration space missions is related to the determination of the adaptive capabilities of the human body in new environmental conditions which are unusual for life on earth. A long exposure of man to space flight factors produces definite local manifestations of stress reactions. This stage is followed by a state of partial adaptation. It can be expected that changes in the general and molecular-cellular regulatory mechanisms forming the basis of immunity may be the starting point for the decrease of immune protection. G.R.

A74-13746 Photon absorptiometry measurements of bone mineral in Apollo 14 and 15. J. M. Vogel and R. J. Friedman (U.S. Public Health Service Hospital, San Francisco, Calif.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 322-324. 15 refs.

Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 322-326. 7 refs.

Studies are discussed of the effects of weightlessness on bone to be expected during prolonged space exploration. Ground-based investigations designed to mimic the altered physiologic state have been used to construct a time-effect curve. Because bedrest most closely resembles the weightless state, the bone mineral changes during periods of up to 9 months of bedrest have been used to predict the magnitude of these changes in a O-G environment. Remedial measures to reduce bone mineral loss are also considered.

G.R.

A74-13747 Relationships of serum lactate and pH to serum ionic calcium. J. C. Low, Y.-Y. Dkuh, J. S. McNeill, and J. M. Earll (U.S. Army, Walter Reed Institute of Research, Washington, D.C.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 331-334. 6 refs.*

The response of ionic calcium to changes of lactate was investigated in vitro as well as in vivo. Mongrel dogs were used in the investigation. A progressive drop in ionic calcium with increasing concentration of lactate was observed. Changes of lactate, ionic calcium, total calcium, hydrogen ion concentration, and bicarbonate ion concentration are discussed. The decrease of ionic calcium is plotted against lactate concentration during the infusion and postinfusion periods.

G.R.

A74-13748 Physical energy expenditure in long haul cabin crew. R. M. Barnes (Air Corporations Joint Medical Service, London, England). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 335-337. 6 refs.*

Evaluation of the physical energy expended by a passenger cabin crew in the performance of their work during a BOAC long-distance flight. Stewardesses and stewards were interviewed regarding the stresses of their work which was broken down to serving meals, galley work, bar service, and dressing aircraft. Physical measurements and gas metabolism analysis were conducted in simulation experiments on female and male subjects, assuming average weights of 55 and 70 kg, respectively. It is concluded that a cabin crew's daily working load is great, because of sustained activity rather than a heavy energy expenditure at any one moment, but is within acceptable limits of physical work.

V.Z.

A74-13749 Psycho-sociological consequences of aircraft noise. H. C. W. Stockbridge and M. Lee (Civil Aviation Authority, London, England). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 338-340.*

Social surveys and analysis of complaints are considered as approaches to the evaluation of the psycho-sociological effects of aircraft noise. Both approaches are compared and their strengths and weaknesses are noted, pointing out that complaints tend to come from more affluent neighborhoods and may not represent a random sampling of residents. The quieting of aircraft, expected to be largely overcome in about two decades, is believed to be the only satisfactory solution.

V.Z.

A74-13750 Serious omissions in flight physicals. A. P. Sauer. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 341-343.*

Discussion of a physical health testing program which is evaluated in Germany as a more thorough alternative to present standard tests in providing a better coverage and detection of physical deficiencies in civil aviation pilot candidates. A detailed listing of tests is included and an evaluation of a total of 804 cases examined over a period of eight years is given, showing the presence of serious handicaps in 6.5 per cent of all applicants which would not have been detected by present tests required by law.

V.Z.

A74-13751 Further sleep patterns of airline pilots on world-wide schedules. F. S. Preston (British European Airways Corp.; British Overseas Airways Corp., London, England). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 344-349. 18 refs.*

Sleep pattern data are given for the flight deck crew of a B 707-436 aircraft covering eleven flight legs, from July 13 through July 28, on a Far East schedule. The crew kept careful sleep logs over the entire month during which the flight took place. All five subjects showed varying degrees of sleep deprivation on arrival in Hong Kong after dead head flight. Some indication of an increase in cumulative sleep loss with the age of crew members is pointed out. It is urged that all arrangements for adequate sleep at all sleep stations be made and attention be given to immediate previous duties of crew members to normalize their sleep patterns on world-wide schedules.

V.Z.

A74-13752 Elaboration of space crew selection criteria using ground-based modeling. T. N. Krupina, T. V. Benevolenskaia, E. I. Matsnev, G. P. Mikhailovskii, A. Ia. Tizul, N. I. Tsiganova, and I. Ia. Iakovleva. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 350, 351.*

A74-13753 * The pathology of isolation and inactivation of monkeys. M. N. Golarz de Bourne, G. H. Bourne, H. M. McClure, and M. E. Keeling (Emory University, Atlanta, Ga.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 355-357. Grants No. NGR-11-001-016; No. NIH-RR-00165.*

A74-13754 Clinical experience with left bundle branch block. J. E. Smith (United Air Lines, Inc., Washington, D.C.) and G. J. Kidera (United Air Lines, Inc., Chicago, Ill.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.) Revue de Médecine Aéronautique et Spatiale, vol. 12, 2nd Quarter, 1973, p. 362, 363. 7 refs.*

Eight cases of pilots who developed left bundle branch block conditions after 3 to 28 years of flying without incident are evaluated for further flying adequacy. Seven cases without other clinical evidence of heart disease are qualified as having an apparently excellent prognosis. One case with clinical evidence for a poor left

ventricular function appeared to present too high a hazard for commercial flying. V.Z.

A74-13755 Hypoglycemia in airline pilots. C. R. Harper (Aviation Insurance Agency, Inc., Atlanta, Ga.) and G. J. Kidera (United Air Lines, Inc., Chicago, Ill.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 364-366. 20 refs.

A74-13756 Psychophysical reactions of pilots of supersonic aircraft in flight (Réactions psychophysiques des pilotes des avions supersoniques en vol). R. Debijadji, L. Perovic, S. Nagulic, and D. Djurakic (Institut de Médecine Aéronautique, Zemun, Yugoslavia). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 367-371. 29 refs. In French.

Pilots of supersonic aircraft were subjected to in-flight tests which included electrocardiograms, checks of cardiac frequency, and determination of urine catecholamine excretion. The subjects were separated into two groups, one comprised of pilots with little experience, and the other of pilots with much flight experience. Their flight programs were highly complex. Good correlation was found between cardiac frequency and intensity of the sympatho-adrenal reaction on the one hand, and piloting experience and type of flight program on the other hand. F.R.L.

A74-13757 Effects of DPH /sodium diphenylhydantoinate/ upon concentration in pilots. L. Haward (Graylingwell Hospital, Chichester, Sussex, England). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 372-374. 14 refs.

A74-13758 Some aspects on protein metabolism in men in feeding with space-type diets. V. P. Bychkov, T. A. Smirnova, and S. K. Kalandarov. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 375, 376.

A74-13759 Morphologic and electromyographic investigations on the influence of hypodynamia on the functional efficiency of muscles. S. Baranski, Z. Edelwejn, W. Stodolnik-Baranska, and Z. Sarol (Instytut Medycyny Lotniczej, Warsaw, Poland). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 380-382.

A74-13760 Effect of space cabin environmental parameters and space flight factors on certain mechanisms underlying immunological reactivity. I. V. Konstantinova and E. N. Antropova. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 383-388. 34 refs.

The transformation of circulating lymphocytes was studied in cosmonauts who participated in orbital flights aboard the spacecraft Soyuz-6, Soyuz-7, Soyuz-8, and Soyuz-9. The effect of environmental changes during a prolonged stay of subjects in a sealed chamber was also investigated. The data obtained indicate that the functional test used to characterize the state of the cell population may provide an informative index concerning the changes of body reactivity in response to space flight factors. It is found that lymphocyte activation during immunological reactions both in the organism and in a model system in vitro depends definitely on the potassium concentration in the medium. G.R.

A74-13761 Hypoxic variations of blood coagulability and acid-base balance (Variations hypoxiques de la coagulabilité sanguine et équilibre acidobasique). M. V. Strumza, J. Hainaut, and J. M. Strumza-Poutonnet (Paris, Université, Laboratoire de Biologie Aéronautique, Paris; Ministère des Armées, Centre de Transfusion de l'Armée, Clamart, Hauts-de-Seine, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 389-391. In French.

A74-13762 Clinical aspects of deafness in aircrew - Baro-sono-traumatic deafness (Aspects cliniques de la surdité chez l'aviateur - La surdité baro-sono-traumatique). L. R. Bordes (Hôpital d'instruction des Armées Dominique Larrey, Versailles, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 396-398. In French.

A74-13763 The appearance of gastric ulcerations after the repeated action of accelerations /positive Gz, positive Gx/ (L'apparition des ulcérations gastriques après l'action répétée des accélérations /plus Gz; plus Gx/). P. Groza, S. A. Cananau, and B. Zaharia (Institutul Medico-Farmaceutic, Bucharest, Rumania). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 399-403. 37 refs. In French.

In view of the stress-causing character of the action of hypergravitations, the structural modifications brought about by accelerations either during short-term or long-term experiments were studied. Accelerations were applied to guinea pigs as follows: 10 positive Gz, 10 negative Gz, and 10 positive Gx during 3-minute periods at 30-minute intervals (short-term experiment) and 10 positive Gz and 10 positive Gx according to the same system over a succession of 30 days (long-term experiment). In the short-term experiments modifications of a functional nature were observed. In the long-term experiments the appearance of ulcerations and erosions of the gastric mucous membrane was noted. These were more or less serious depending on the parameters of the hypergravity vector (size and direction). F.R.L.

A74-13764 Aeromedical consultation service. W. H. King (USAF, School of Aerospace Medicine, San Antonio, Tex.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 404-406.

The objectives of the aeromedical consultation service include the evaluation of patients with difficult or obscure medical problems

and the evaluation of normal individuals who are candidates for special flight operations. Another task is to provide assistance to unit flight surgeons in maintaining a high degree of medical fitness among flying personnel. Causes for referral are considered, taking into account cardiovascular disease, neurological defects, diseases of the eye, and psychiatric problems. G.R.

A74-13765 Pathogenesis of transport sickness (Pathogénie du mal des transports). G. L. Komendantov. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 409-411. In French.

This malady, even in its latent forms, is prejudicial to the capacity of pilots and cosmonauts to work, in that it is harmful to their faculties and professional qualities. Transport sickness is consequent on the summation of reactions of the receptors of analyzers of space. The effectiveness of prophylactic measures depends above all on knowledge of the etiology and pathogenesis of the illness. Air sickness passes through four phases: increased excitation, inhibition, periodic activity, and stupor. F.R.L.

A74-13766 General and private aspects of flight fatigue. D. K. A. Pimenova. (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 412, 413.

Relations between the reticular formation and fatigue are discussed. Flight fatigue which sets in when flights are performed under complex meteorological conditions is considered. General characteristics of fatigue are related to a regress in work performance, the development of hypnotic phases in the activity of the cortex, and the breakup of new reinforced work skills. The consequences of fatigue upon the operational performance of a pilot are described. G.R.

A74-13767 Present situation of aeromedical evacuations in France (Situation actuelle des évacuations sanitaires aériennes en France). A. Salvagnac (Ministère des Armées /Air/, Service de Santé, Paris, France). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 416-418. In French.

A74-13768 * Illusory sensations in aircraft flight and weightlessness. R. J. von Baumgarten, G. Shillinger, Jr., and G. Baldrighi (Michigan, University, Ann Arbor, Mich.; NASA, Ames Research Center, Moffett Field, Calif.). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 419, 420. 8 refs.

Clearly misleading illusions only appear when the vestibular input is of a nonconflicting nature. A number of experiments with blind goldfish were conducted since the vestibular system of the goldfish is homologous in many respects to that of man. Inertial stimuli were given by linear acceleration of the entire aquarium with the fish in it. A high-speed movie camera and three-axis accelerometers were used to record the fish responses. It was found that fish, if subjected to horizontal linear acceleration, behave as if the moving force acting on the otoliths were a gravitational force component and not an inertial reacting force. G.R.

A74-13769 The vectorcardiogram in reduced oxygen pressure. G. Fiedler and J. Wirth (Medizinischer Dienst, Berlin, East Germany). (*Académie Internationale de Médecine Aéronautique et Spatiale and Société Française de Physiologie et de Médecine Aéronautiques et Cosmonautiques, Congrès International de Médecine Aéronautique et Spatiale, 20th, Nice, France, Sept. 18-21, 1972.*) *Revue de Médecine Aéronautique et Spatiale*, vol. 12, 2nd Quarter, 1973, p. 421-423. 5 refs.

Investigations with 50 healthy subjects were conducted in a decompression chamber. An altitude of 5000 m. was simulated. Immediately after reaching the altitude of 5000 m a significant decrease of the vectors in all planes and in the spatial loops was observed. After 15 min the vectors increased again until the old magnitude was reached at the end of the experiment. G.R.

A74-13794 Psycho-acoustic results of an interdisciplinary study on effects of aircraft noise on man. R. Martin, B. Rohrmann, and H.-O. Finke (Physikalisch-Technische Bundesanstalt, Braunschweig; Mannheim, Universität, Mannheim, West Germany). In: INTER-NOISE 73; Proceedings of the International Conference on Noise Control Engineering, Copenhagen, Denmark, August 22-24, 1973. Lyngby, INTER-NOISE 73, Danmarks Tekniske Højskole, 1973, p. 289-297.

An interdisciplinary interpretation is presented for the acoustical and socio-psychological results of a study of aircraft noise effects on people. Participants in this study include specialists in acoustics, medicine, organization, general psychology, social sciences, and work psychology. M.V.E.

A74-13832 Hypoxia and the arterial surface. J. B. Boatman and S. D. Carter (Battelle Columbus Laboratories, Columbus, Ohio). *Archives of Environmental Health*, vol. 27, Dec. 1973, p. 360-363. 6 refs. Grant No. NIH-HE-14031.

Adult rabbits were exposed to reduced oxygen environments (12% to 14%) for 72 hours by dilution of room air with compressed nitrogen. Aortic surfaces were examined by scanning electron microscopy. Control animals were similarly processed at normal levels of oxygen. Patterns of linear folds running in the direction of blood flow were observed in control animals, with endothelial cells tightly attached to the underlying internal elastic membrane. Hypoxic arterial surfaces showed grossly distorted linear folds, with swollen and convoluted endothelial surfaces which obscured the spaces between the folds while preserving the plicate organization. These changes resemble the reported effects of moderate carbon monoxide exposure. Accumulation of subendothelial fluid appeared to channel the length of the fold, and to present a swollen endothelial surface susceptible to injury by the pulsatile blood flow. (Author)

A74-13853 * *Bacillus* sp. ATCC 27380 - A spore with extreme resistance to dry heat. W. W. Bond, M. S. Favero, and M. R. Korber (U.S. Public Health Service, Center for Disease Control, Phoenix, Ariz.). *Applied Microbiology*, vol. 26, Oct. 1973, p. 614-616. 12 refs. NASA-supported research. NASA Order W-13062.

A74-13887 Interaction of thermal and baroreceptor reflexes in man. D. D. Heistad, F. M. Abboud, A. L. Mark, and P. G. Schmid (Iowa, University; U.S. Veterans Administration Hospital, Iowa City, Iowa). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 581-586. 22 refs. Research supported by the American Heart Association and U.S. Veterans Administration; Grants No. NIH-HL-09835; No. NIH-HL-02644; No. NIH-HL-14388.

The purpose of this study was to consider a possible central interaction of two cardiovascular reflexes: the thermal reflex and the responses of the baroreceptors to lower body negative pressure (LBNP). Vasoconstrictor responses to LBNP were measured in one finger and forearm during immersion of the other arm in hot, warm, or cold water. Changes in temperature in the vascular beds we were

studying were thereby eliminated, allowing examination of the interaction of the reflex effects of thermal and baroreceptor stimuli. We conclude that thermal stimuli modify the baroreceptor reflex and that the interaction of the thermal and baroreceptor reflexes may occur at a central level. (Author)

A74-13888 Cold-induced thermogenesis in dogs - Its reduction by moderate hypoxia. C. M. Blatteis and L. O. Lutherer (U.S. Army, Research Institute of Environmental Medicine, Natick, Mass.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 608-612. 38 refs.

Investigation on dogs of the effect of hypoxia during cold exposure on substrate utilization, metabolic rate, and thermogenesis normally evoked by exposure to cold. The results suggest that the reduced metabolic response to cold during moderate hypoxia might be related to an impaired capacity to greatly accelerate substrate oxidation rather than to a diminished substrate mobilization. M.V.E.

A74-13889 Effects of beta-adrenergic blockade and stimulation on normal human airways. A. E. Tattersfield, D. G. Leaver, and N. B. Pride (Royal Postgraduate Medical School, London, England). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 613-619. 33 refs. Research supported by the Tobacco Research Council.

Airway function was investigated in six normal, nonatopic subjects before and after beta-adrenergic blockade with a large dose (20 mg) of iv propranolol. No changes were observed in airways conductance, lung volume, maximum and partial expiratory flow volume curves, expiratory static pressure-volume curves, or dynamic lung compliance. There was a small increase in inspiratory static lung recoil pressures but this was not statistically significant. Four of the subjects were also studied before and after beta-adrenergic stimulation with inhaled salbutamol. Airways conductance rose in three of the subjects indicating the presence of resting bronchomotor tone. Salbutamol also led to small increases in maximum expiratory flow and a slight decrease in expiratory static lung recoil pressures. We conclude that beta-blockade had no effect on the larger airways and probably had no effect on the smaller airways of these normal subjects. (Author)

A74-13890 Human cerebral blood flow during sleep and waking. R. E. Townsend (U.S. Navy, Medical Neuropsychiatric Research Unit, San Diego, Calif.), P. Prinz, and W. D. Obrist (U.S. Navy, Medical Neuropsychiatric Research Unit, San Diego, Calif.; Duke University, Durham, N.C.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 620-625. 46 refs. Grants No. PHS-NS-06798; No. PHS-MH-08394; No. PHS-MH-50068.

Experiments were undertaken to elucidate further the nature of cerebral blood flow (CBF) changes during both REM and NREM sleep in man. Use was made of a noninvasive regional CBF method, based on the clearance of inhaled Xe-133. Since alterations in arterial carbon dioxide and blood pressure may also occur during sleep, these variables were examined for their possible influence on CBF. The results demonstrate a modest but significant increase in human regional cerebral blood flow (rCBF) during REM sleep, similar in magnitude to the rCBF changes observed during various mental tasks. G.R.

A74-13891 Expiratory flow rate and closing volumes. D. M. Travis, H. F. Don (Harvard University; Peter Bent Brigham Hospital, Boston, Mass.), and M. Green. *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 626-630. 13 refs. Grants No. NIH-HL-14580; No. NIH-GM-AI-16934-02.

Investigation of the effect of expiratory flow rate on closing volume (CV) test results. It is found that CV at slow rates is independent of whole-lung maximum expiratory flow limitation and relatively independent of flow rate. There is dynamic dependence in some individuals, but this effect is small. M.V.E.

A74-13892 Effects of lung volume changes on respiratory drive during hypoxia and hypercapnia. N. S. Cherniack, N. N. Stanley, P. G. Tuteur, M. D. Altose, and A. P. Fishman (Pennsylvania, University, Philadelphia, Pa.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 635-641. 30 refs. Grant No. PHS-HL-08805.

The effect of lung inflation and deflation was assessed in two different sets of experiments. The first set of experiments made it possible to determine the reflex effects of lung volume changes over a wide range of hypoxia and hypercapnia. Questions regarding the persistence of the reflex effects during long-time exposure to different gas tensions were explored in the second set of experiments. The methods used in these two types of experiments are analogous to the rebreathing and steady-state techniques conventionally used to evaluate respiratory drive in spontaneously breathing animals. G.R.

A74-13893 Reduction in maximal oxygen uptake with age. I. Astrand, P.-O. Astrand, I. Hallback, and A. Kilbom (Gymnastik-och Idrottshogskolan; National Board of Occupational Safety and Health, Stockholm, Sweden). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 649-654. 15 refs. Research supported by the Swedish Medical Research Council, Swedish Association against Heart and Lung Diseases, and Swedish Sport Federations. SMRC Project K69-14X-2699-01A; SMRC Project 870-14X-2699-02B.

Thirty-five female and thirty-one male subjects performed submaximal and maximal exercise on a bicycle ergometer in 1949 (age 20-33 years) and again in 1970. All had been well trained in 1949 and most had been physically active in the intervening years. In 1970, their maximal oxygen uptake had declined without exception by approx 20%, i.e., from 2.83 to 2.20 l/min for female subjects and from 4.08 to 3.28 l/min for male subjects. Their maximal heart rate had declined by 15 and 12 beats/min, respectively, with wide individual differences. In 1970 the average heart rate at a given submaximal oxygen uptake was significantly higher than in 1949, but due to marked individual variations in this heart rate response, the reduction in maximal oxygen uptake could not be predicted from the repeated submaximal tests. (Author)

A74-13894 * Effect of skin wettedness on sweat gland response. E. R. Nadel and J. A. J. Stolwijk (Yale University, New Haven, Conn.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 689-694. 18 refs. Grant No. NIH-ES-00354; Contract No. NAS9-9531.

Investigation of the effect of skin wettedness upon sweating rate. Several techniques were used to gain a better understanding of the quantitative nature of this effect. The results include the finding that the evaporative power of the environment has a profound effect on the relationship between body temperature and sweating rate. M.V.E.

A74-13895 Integrated electromyographical activity and muscle work. S. Bouisset and F. Goubel (Lille I, Université, Villeneuve d'Ascq, Nord, France). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 695-702. 36 refs. Délégation Générale à la Recherche Scientifique et Technique Grant No. 72-7-0192.

The relationship between the integrated EMG of the biceps (Qb) and mechanical work (W) was examined for isolated flexion movements of the elbow. The movements were performed in a horizontal plane against either pure inertias or against loads and were stopped either by means of impact with a buffer or by visual control. A constant linear Qb-W relationship was found which was independent of the inertia or load used. The slope of the curve varied only in relation to the angle of the joint at the start of the movement. It was concluded that the Qb-W relationship implies a proportionality between the mechanical work of the muscle and the two physiological mechanisms essentially involved in the grading of the muscular contraction: increase in the number of motor units firing, and increase in their rate of firing. (Author)

A74-13896 Human sweat film area and composition during prolonged sweating. L. G. Berglund and P. E. McNall, Jr. (Michigan Technological University, Houghton, Mich.; Johnson Service Co., Milwaukee, Wis.; Kansas State University, Manhattan, Kan.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 714-718. 18 refs. Grant No. PHS-5-T01-EC-00024.

The chloride ion concentration and area of the human sweat film was monitored on sedentary males exposed for 6 hr to hot environments. Metabolism and skin and rectal temperatures were also measured. The chloride ion concentration of the sweat film increased linearly with time. The sweat film area estimated with an iodine starch staining technique also increased linearly. Skin and rectal temperatures remained constant throughout each test except for the initial transient. It was concluded that the salt accumulating in the sweat film during prolonged sweating inhibits its evaporation by reducing the vapor pressure of the water and causes the area of the film to increase when constant evaporative heat loss is required. Skin and body temperatures are unaffected by the increasing film size as long as the wetted area is less than 100%. (Author)

A74-13897 A variable-speed motorized bicycle ergometer positive and negative work exercise. B. Bigland-Ritchie, H. Graichen, and J. J. Woods (Quinnipiac College, Hamden; John B. Pierce Foundation Laboratory, New Haven, Conn.). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 739, 740. 5 refs. Grant No. PHS-NSO-09960.

A74-13898 A simple method for measurement of oxygen consumption. J. B. Stoker, C. T. Kappagoda, P. N. Thenabadu, and R. J. Linden (Killingbeck Hospital; Leeds, University, Leeds, England). *Journal of Applied Physiology*, vol. 35, Nov. 1973, p. 748-750. 7 refs. Research supported by the British Heart Foundation, Medical Research Council, and Wellcome Trust.

An open-circuit flow-through technique for the measurement of oxygen consumption at rest and during exercise has been described. This technique was compared with the measurement of oxygen consumption by the collection and analysis of expired air and shown to have no systematic error. The random error (95% tolerance limits) of the method was assessed by the repeated measurements of oxygen consumption in subjects at rest and shown to be plus or minus 2%. The value of this technique in the routine haemodynamic assessment of patients by cardiac catheterization has been discussed. (Author)

A74-13917 Influence of age and ischemic heart disease on spatial ST-T magnitudes at rest and after maximal exercise. M. Niederberger, R. A. Bruce, V. Hofer (Washington, University, Seattle, Wash.), and G. E. Dower. *Journal of Electrocardiology*, vol. 6, no. 4, 1973, p. 279-284. 7 refs. Grant No. NIH-HL-13517-2.

A74-13918 Pitfalls in the prediction of coronary artery disease from the electrocardiogram or vectorcardiogram. J. Hilsenrath, R. I. Hamby, and I. Hoffman (Long Island Jewish-Hillside Medical Center, New Hyde Park, N.Y.). *Journal of Electrocardiology*, vol. 6, no. 4, 1973, p. 291-302. 30 refs.

Seventy-eight patients with inferior, lateral, and dorsal myocardial infarction patterns are reported together with the corresponding coronary pathology determined by cineangiography. Of 41 patients satisfying standard criteria for inferior wall myocardial infarction, 11 were free of significant coronary artery disease. Of 21 cases meeting the revised criteria for dorsal wall myocardial infarction 6 were free of significant coronary artery disease. Of 16 patients satisfying the criteria for isolated lateral wall myocardial infarction 4 were free of significant coronary artery disease. G.R.

A74-13919 Some parameters associated with the normal atrial electrocardiogram. R. A. Larsen, H. W. Smith, and D. A. Brody (Tennessee, University, Memphis, Tenn.). *Journal of Electrocardiology*, vol. 6, no. 4, 1973, p. 325-333. 9 refs. Grants No. NIH-HL-01362; No. NIH-HL-14032; No. NIH-HL-09495.

The relationship between orthogonal and scalar leads is considered together with the direction of transfer vectors, the prevalent direction and precision of scalar lead transfer vectors, orthogonal lead templates, and scalar lead templates. The criteria characterizing the normal atrial electrocardiogram developed are applied to individual subjects. Relationships among the different variation scores are studied. G.R.

A74-13924 # Some medicobiological investigations performed according to the Gemini and Apollo programs - Changes in weight and cardiovascular system indices of the astronauts. I (Nekotorye rezul'taty mediko-biologicheskikh issledovaniy, vypolnennykh po programmam 'Dzhemini' i 'Apollon' - Izmenenie vesa i pokazatelei serdechno-sosudistoi sistemy u kosmonavtov. I). V. I. Kopanov and E. M. Iuganov. *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaya*, Sept.-Oct. 1973, p. 629-646. 37 refs. In Russian.

Summary of the results obtained from studies of changes in weight and cardiovascular system indices undergone by Gemini and Apollo astronauts. It was found that astronauts lost weight during space flight and regained it promptly (within 1 to 2 days) after flight completion. Such changes are believed to be caused by organism dehydration. In post-flight examinations, there has been observed a reduction of orthostatic stability resulting from effects of weightlessness. After space flights that included lunar landings, orthostatic disorders were less pronounced. Observed changes in cardiovascular system indices represent adaptive reactions to the unusual conditions of space flight. M.V.E.

A74-13925 # Investigation methods for the visual functions of operators in flight vehicle cabins of small overall size (Metody issledovaniia zritel'nykh funktsii operatorov v usloviakh malogabaritnykh kabin letatel'nykh apparatov). E. A. Ivanov. *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaya*, Sept.-Oct. 1973, p. 647-657. 5 refs. In Russian.

Analysis of investigation objectives in visual function studies on flight crew members, namely: tolerance limits for measurement errors and the required measurement performance time. On the basis of this analysis, a practical investigation scheme is proposed that includes the performance of comparative, variously accurate, ground and in-flight visual function measurements on flight vehicle operators. The permissible standard error limits determined for in-flight measurements amount to plus or minus 20%. Special visual test tables are described that satisfy the test requirements determined. M.V.E.

A74-13926 # Micro- and ultramicroscopic changes in human epidermis during autolysis (Mikro- i ul'tramikroskopicheskie izmeneniia epidermisa cheloveka pri autolize). I. N. Mikhailov. *Akademiia Nauk SSSR, Izvestiia, Seria Biologicheskaya*, Sept.-Oct. 1973, p. 658-663. 6 refs. In Russian.

Review of the results of autolysis studies performed by optical and electron microscopy upon human epidermis stored in a damp storage-chamber atmosphere at 4 and 37 C for periods ranging from 2 hrs to 3 days. Autolytic changes were found to start earlier and to proceed faster at 37 C than at 4 C, while the character of the cell structure damage caused by autolysis showed no essential difference. M.V.E.

A74-13960 * Ultraviolet selection pressure on the earliest organisms. C. Sagan (Cornell University, Ithaca, N.Y.). *Journal of Theoretical Biology*, vol. 39, 1973, p. 195-200. 22 refs. Grant No. NGR-33-010-101.

It had been proposed by Sagan (1957, 1961) that UV light, partially penetrating the primitive reducing atmosphere of the earth, posed a major problem for the earliest evolution of life. This argument is now updated and refined. The picture of a secondary reducing atmosphere is presented. It is assumed that an excess of hydrogen from this atmosphere has already escaped to space. The

genetic material surrounded itself as a solution to the UV selection pressure with bases or nucleotides having no function whatever in replication or protein synthesis. G.R.

A74-14109 Earth orbital systems and biomedical research. R. T. Jordan (Charles F. Kettering Research Laboratory, Yellow Springs, Ohio). In: Space Shuttle payloads; Proceedings of the Symposium, Washington, D.C., December 27, 28, 1972.

Tarzana, Calif., American Astronautical Society, 1973, p. 109-140. 50 refs.

Some aspects of biological processing as a candidate technology in the Space Shuttle program are examined. The justification for biological processing in zero- or low-g environments is based, among other factors, on the detrimental influence of gravity-induced buoyancy. Significant applications of the absence of buoyancy and the resulting stability of mixtures in the liquid-solid, liquid-gas, and liquid-liquid complexes are discussed. Liquid-liquid mixture stability in a weightless fermentation dialysis system, for example, will prevent or reduce segregation between elements of different densities, and permit supersaturation of metabolic end products or synthesized compounds produced by microorganisms and distributed into the liquid environment. V.P.

A74-14117 * Teleoperators and EVA for Shuttle missions. T. B. Malone (Essex Corp., Alexandria, Va.) and S. Deutsch (NASA, Office of Life Sciences, Bioengineering Div., Washington, D.C.). In: Space Shuttle payloads; Proceedings of the Symposium, Washington, D.C., December 27, 28, 1972. Tarzana, Calif., American Astronautical Society, 1973, p. 303-324.

Review of the methods currently being contemplated for enabling the Space Shuttle to perform the Shuttle and payload support missions. Two general approaches to carrying out such activity are discussed - namely, the use of teleoperators and astronaut extravehicular activity (EVA). Detailed descriptions are given of an attached manipulator system (AMS) and a free-flying teleoperator (FFTO), noting the applications, capabilities, and limitations of each. The primary technology development areas for the AMS are in the areas of stabilization, structure, and manual control, while the technology areas of primary concern in the case of the FFTO include the manipulator-grapple system, the control system, the video system, and the mobility system. Four modes of EVA that are possible for the Shuttle are cited, noting the unlikelihood of direct applicability of EVA to payload deployment and retrieval and its feasibility for payload servicing and experiment support. A.B.K.

A74-14125 # Spatial summation of retinal excitation as obtained by the scotopic VECF and the sensory threshold. E. Adachi-Usami (Max-Planck-Institut für physiologische und klinische Forschung, Bad Nauheim, West Germany) and F.-J. Kellermann (Universitäts-Augenklinik, Frankfurt am Main, West Germany). *Ophthalmic Research*, vol. 5, no. 5, 1973, p. 308-316. 10 refs.

Experiments on subjects show that spatial summation measured by recording the visual evoked cortical potential is similar to that measured from sensory thresholds, for a visual field diameter up to 18 deg around the fixation point. Aerial summation was observed over the entire covered area within this angle. Lack of retinal homogeneity, rather than aerial summation itself, is believed to be responsible for the slight systematic discrepancies between the results of the two series of tests. V.Z.

A74-14139 Alteration of EEG activity of the hypothalamus by thermal stimulation of the spinal cord. W. Wünnenberg (Giessen, Universität, Giessen, West Germany). *Pflügers Archiv*, vol. 344, no. 1, 1973, p. 75-82. 20 refs.

A74-14140 * Thermal death of a hydrocarbon bacterium in a nonaqueous fluid. M. M. Severance and P. A. LaRock (Florida State University, Tallahassee, Fla.). *Journal of Bacteriology*, vol. 116, Dec. 1973, p. 1287-1292. 14 refs. Grant No. NGR-10-004-041.

A hydrocarbon-utilizing *Brevibacterium* which grew into the oil phase of an oil-water system was tested for survival at elevated temperature. Cells suspended in oil and cells that had been resuspended in aqueous solution were tested by placing 1-ml samples of the cell suspension in small test tubes immersed in a controlled-temperature water bath. The resultant survival curves in oil consisted of two parts, a flat shoulder obtained in the first half of the heating period, followed by a break indicating rapid die-off. The break in the curves occurred after 50% of the cells were killed. This occurred at exposures of 25, 15, and 8 min for 78, 88.6, and 96.2 C, respectively. The survival curve for 63.5 C in the aqueous solution was a rapid, exponential die-off. The actual increase in survival of the organism in oil is reflected by the length of the shoulder portion. The shoulder occurs only in an oil medium and is increased by decreasing temperature and increasing age of the culture. (Author)

A74-14141 Otitic and sinus barotraumatism (Barotraumatismos oticos y sinusales). P. Gómez Cabezas. *Revista de Aeronáutica y Astronáutica*, vol. 33, Oct. 1973, p. 767-782. In Spanish.

Variations of atmospheric pressure, as produced by the ascent or the descent of an aircraft in the atmosphere, cause a number of disturbances in the organism of a subject. These disturbances are not connected with the effects of hypoxia. The disturbances can be related to the expansion or negative pressures of gases contained in the natural receptacles of the body. Another factor is the formation of gases or gas bubbles in tissues as a consequence of the absence of equilibrium between the pressure of the dissolved gas and the external gas pressure. The occurrence of barotraumatism due to particular flight situations or conditions produced during diving operations is discussed together with approaches for diagnosing the symptoms. Methods of treatment for the barotraumatism considered are also reported. G.R.

A74-14178 # The role of certain physicochemical parameters of ions in iontophoretic permeability of the living skin (Rol' nekotorykh fiziko-khimicheskikh parametrov ionov v ionoforeticheskoj pronitsaemosti zhivoi kozhi). V. S. Uloshchik (Belorusskii Nauchno-Issledovatel'skii Institut Nevrologii, Neirokhirurgii i Fizioterapii, Minsk, Belorussian SSR). *Akademiia Nauk BSSR, Doklady*, vol. 17, Oct. 1973, p. 965-967. 6 refs. In Russian.

A74-14287 International Symposium on Electrolytic Disorders in Cardiology, Rome, Italy, December 7-9, 1972, Proceedings (Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, December 7-9, 1972, Proceedings). *Acta Cardiologica, Supplementum*, no. 17, 1973. 332 p. In French and English.

The papers deal with the physiopathology of hydroelectrolytic troubles in cardiac insufficiency, the influence of electrolyte disturbances on electromechanical coupling, electrolytic bases of the potential of cardiac action, comparative studies of the (Na⁺, K⁺) ATPase-activity and digitalis sensitivity in the nodal tissue and the myocardium, and electrolytes and arterial hypertension. Attention is given to hypnoatremic syndromes of cardiological interest, synthetic and natural polypeptides related to the pituitary, and their natriuretic activity in animals and man.

F.R.L.

A74-14288 # Physiopathology of hydroelectrolytic troubles of cardiac insufficiency (Physiopathologie des troubles hydroélectrolytiques de l'insuffisance cardiaque). J. Guedon, M. Luscko (Institut National de la Santé et de la Recherche Médicale, Suresnes, Hauts-de-Seine, France); and J. Lissac (Hôpital Boucicaut, Paris, France). (Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 25-40. 43 refs. In French.

Whenever the cardiac output becomes inadequate to meet the total metabolic requirement, hemodynamic metabolic and endocrinological changes always take place leading to extracellular fluid

accumulation. These disorders may be considered as a tentative process of adaptation to and compensation for the low output state. Renal blood flow is reduced with only slight change in glomerular filtration rate, so that filtration is increased. The consequences of hemodynamic and hormonal disturbances on salt and water excretion are obvious. Fractional reabsorption of sodium increases, related to changes in hydrostatic and oncotic pressures in peritubular capillaries and to hyperaldosteronemia. Free water clearance is impaired explaining the dilutional syndrome often encountered in cardiac failure. F.R.L.

A74-14289 # Influence of electrolyte disturbances on electromechanical coupling. W. G. Nayler (Cardiothoracic Institute, London, England). (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 76-85. 28 refs. Research supported by the National Heart Foundation of Australia and Medical Research Council of England.

In heart muscle excitation-contraction coupling depends upon an inward displacement of Ca^{2+} from the extracellular to the intracellular phase. This inward displacement of Ca^{2+} is facilitated by a raised intracellular concentration of Na^{+} and a reduced extracellular concentration of Na^{+} and K^{+} . The activation of the mechanical response may require the further release of additional Ca^{2+} from intracellular binding sites. Various divalent cations, including Zn^{2+} and Mn^{2+} impair excitation-contraction coupling in heart muscle by interfering with the initial inwards displacement of Ca^{2+} . F.R.L.

A74-14290 # Electrolytic bases of the potential of cardiac action (Bases électrolytiques du potentiel d'action cardiaque). E. Coraboeuf. (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 86-102. 75 refs. In French.

Following a brief review of the characteristics of the action potentials of the different tissues of mammalian hearts, the evolution of these potentials is described in terms of ionic currents and membrane conductance according to the ionic theory of Hodgkin and Huxley (1952). In most of the tissues of the heart there is a rapid sodium conductance (gNa) causing the initial depolarization of the action potential. The plateau of the cardiac action potential is due to the development of a calcium conductance (gCa), associated in certain cases with a slow sodium conductance (slow gNa), together with a quasi-instantaneous decrease of the potassium conductance (gK sub 1) and, in the conducting tissue, with an incomplete inactivation of the rapid gNa. The role of active ionic transports in the genesis of membrane potentials is discussed. F.R.L.

A74-14291 # Comparative studies of the Na^{+} K^{+} ATPase activity and digitalis sensitivity in the nodal tissue and the myocardium. W. Kübler and P. von Smekal. (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 103-113. 12 refs. Research supported by the Deutsche Forschungsgemeinschaft.

A74-14292 # Electrolytes and arterial hypertension (Electrolytes et hypertension arterielle). F. Reubi (Bern, Universität, Berne, Switzerland). (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 180-188. 29 refs. In French.

In benign essential hypertension of man, there is no alteration of blood electrolytes or exchangeable sodium or blood volume. In malignant forms, hyperreninemia, secondary hyperaldosteronism and hypokaliemia are often found. Primitive hyperaldosteronism is characterized by a depletion in potassium. Chronic hypertensive parenchymatous renal diseases are sometimes hypervolemic. Electrolytic serum changes in uremia hardly modify blood pressure.

Hypertension in acute glomerulonephritis appears to be related to retention of water and sodium; hypertension that can occur in primitive hyperparathyroidism is a consequence of hypercalcemia. One of the elements in the treatment of any arterial hypertension is a decrease in sodium content. F.R.L.

A74-14293 # Hyponatremic syndromes of cardiologic interest (Les syndromes hyponatrémiques d'intérêt cardiologique). T. Di Perri (Siena, Università, Siena, Italy). (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 197-210. 14 refs. In French.

The hyponatremic syndrome is the result of severe disorders of the hydroelectrolytic metabolism which may be either acute or chronic. From the physiopathological standpoint it is possible to differentiate between hyponatremic syndrome due to sodium deficit, potassium deficit, and by dilution. In cardiology, hyponatremia occurs mostly in refractory cardiac insufficiency with severe impairment of glomerular filtration, either following extensive treatment with salidiuretics, or in essential hypertension with protracted salidiuretic treatment. Knowledge of the basic mechanism underlying these phenomena is essential for their clinical containment and for the selection of the therapeutic steps which differ widely between the three kinds of hyponatremia under consideration. F.R.L.

A74-14294 # Synthetic and natural polypeptides related to the pituitary and their natriuretic activity in animals and man. J. H. Cort (Czechoslovak Academy of Sciences, Institute of Organic Chemistry and Biochemistry, Prague, Czechoslovakia). (*Symposium International sur les Troubles Electrolytiques en Cardiologie, Rome, Italy, Dec. 7-9, 1972.*) *Acta Cardiologica, Supplementum*, no. 17, 1973, p. 219-228. 7 refs.

A74-14339 * Behavioral regulation of gravity - Schedule effects under escape-avoidance procedures. F. C. Clark (Mississippi University, University, Miss.), K. O. Lange (Kentucky University, Lexington, Ky.), and R. E. Belleville (National Institutes of Health, National Institute of Mental Health, Washington, D.C.). *Journal of the Experimental Analysis of Behavior*, vol. 20, Nov. 1973, p. 345-353. 21 refs. Grants No. NGL-18-001-003; No. NGR-34-003-041.

Squirrel monkeys were restrained in a centrifuge capsule and trained to escape and avoid increases in artificial gravity. During escape-avoidance, lever responses reduced, centrifugally simulated gravity or postponed scheduled increases. The effect of variation in the interval of postponement (equal to the duration of decrease produced by escape responses) was studied under a multiple schedule of four components. Three components were gravity escape-avoidance with postponement times of 20, 40, and 60 sec. The fourth component was extinction. Each component was associated with a different auditory stimulus. Rate of responding decreased with increasing postponement time and higher mean g-levels occurred at shorter intervals of postponement. Effects of the schedule parameter on response rate and mean g-level were similar to effects of the schedule on free-operant avoidance and on titration behavior maintained by shock. (Author)

A74-14340 Concurrent schedule control of human visual target fixations. P. B. Rosenberger (Eunice Kennedy Shriver Center, Washington, D.C.). *Journal of the Experimental Analysis of Behavior*, vol. 20, Nov. 1973, p. 411-416. 7 refs. Grant No. NIH-HD-05124.

Operant conditioning techniques were applied to the study of how target fixations are controlled by the probability of signal occurrence. In a standard vigilance setting, gaze at three illuminable volt meters was monitored by a Mackworth television eye camera with automatic recording capability. Gaze at a given meter produced illumination of the meter, and signals (deflections of the needle on the meter) were scheduled as intermittent consequences of this response. Target fixations were thus placed under the control of

concurrent variable-ratio, differential-reinforcement-of-low-rate, and fixed-interval schedules in normal adult volunteers. (Author)

A74-14341 * Latency differentiation of hits and false alarms in an operant-psychophysical test. M. Terman and J. S. Terman (Northeastern University, Boston, Mass.). *Journal of the Experimental Analysis of Behavior*, vol. 20, Nov. 1973, p. 439-445. 16 refs. Grants No. PHS-MH-17892-01; No. NGR-22-011-070.

A74-14342 * Stimulus control in a two-choice discrimination procedure. W. D. Galloway (U.S. Public Health Service, Bureau of Radiological Health, Rockville, Md.). *Journal of the Experimental Analysis of Behavior*, vol. 20, Nov. 1973, p. 473-482. 23 refs. Grant No. NSG-450.

Experimental investigation upon pigeons of the relation between performance during discriminative training and subsequently obtained stimulus control test results. The results obtained support the proposition that bias generated by training dependencies is a major determiner of stimulus control. M.V.E.

A74-14343 Automatic ECG and blood pressure measurement in multitesting - Correlation of blood pressure and ECG abnormalities. H. M. Hochberg, M. E. D. George, E. L. Schmalzbach (Roche Medical Electronics, Cranbury, N.J.), and C. A. Caceres. *American Heart Journal*, vol. 86, Dec. 1973, p. 764-770. 15 refs.

A74-14356 Effect of prior noise or prior performance on serial reaction. L. R. Hartley (Medical Research Council, Cambridge, England). *Journal of Experimental Psychology*, vol. 101, Dec. 1973, p. 255-261. 11 refs.

Factorial study of the effect of prior noise or prior performance on serial reaction, using 13 enlisted men. They performed a 5-choice serial reaction test in the last half of, or throughout, a 40-min session. Noise was presented in either the first half, the second half, or throughout the session. The results indicate that: (1) noise has a cumulative adverse effect on performance, (2) the amount of impairment is determined by the duration of exposure to noise, and (3) the impairment caused by noise and performance is additive. M.V.E.

A74-14357 Acquisition and extinction of human eyelid conditioned response as a function of schedule of reinforcement and unconditioned stimulus intensity under two masked conditioning procedures. B. C. Schurr and W. N. Runquist (Alberta, University, Edmonton, Alberta, Canada). *Journal of Experimental Psychology*, vol. 101, Dec. 1973, p. 398-401. 5 refs.

A74-14545 # The quantum-wave theory of the coherent model of the brain - Structure of the coherent brain (K kvantovo-volnovoi teorii kogerentnoi modeli mozga - Struktura kogerentnogo mozga). V. V. Chavchanidze (Akademii Nauk Gruzinskoi SSR, Institut Kibernetiki, Tiflis, Georgian SSR). *Bionika*, no. 7, 1973, p. 102-112. 47 refs. In Russian.

A number of postulates related to the quantum-wave theory and neurophysiology are stated in an attempt to construct a coherent mathematical model of the human brain. The more significant of the postulates are as follows: unconscious mental processes occurring in the brain have a quantum-wave nature and are subject to quantum logic; conscious mental processes in the brain are of a classical nature and are executed in time and space by c-type neurons; the dual symmetric cerebral structures are the loci of Hermitian conjugate mental processes; parallel conscious and unconscious mental activities of the brain are relied on some three types of memory; and efferent sensory information fed into the brain has a quantum-wave nature. V.Z.

A74-14546 Semiblockings of the left branch of the His bundle (Les hémiblocs de la branche gauche du faisceau de His). J. Renambot and E. Bertrand (Clinique Médicale, Abidjan, Ivory

Coast). *Médecine et Armées*, vol. 1, Nov. 1973, p. 49-54. 8 refs. In French.

Results of an electrocardiographic study of conduction disorders affecting the left semibranches of the His bundle and their associations. A conception of disorders of left ventricular conduction is developed which makes it possible to explain atypical electrocardiographic aspects such as extreme deviations of the QRS axis and has prognostic significance particularly with regard to possible evolution toward a permanent slow pulse. A.B.K.

A74-14585 Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Edited by M. P. Ranc, Jr. and T. B. Malone (Essex Corp., Alexandria, Va.). Santa Monica, Calif., Human Factors Society, Inc., 1973. 550 p. Members, \$10.00; nonmembers, \$15.

Spatial and temporal aspects of target detection with visually time-compressed radar displays, the development of a prediction model for dynamic visual inspection tasks, and check reading as a measure of display legibility are among the topics covered in papers concerned with advances in human factors methodology. Other areas covered include applications of human factors to consumer problems, human factors and the handicapped, and manpower and training for industry. M.V.E.

A74-14586 BIOLABS and human factors. H. T. Fisher (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 1-9. 7 refs.

Review of the BIOLABS program, initiated in August 1964 to ultimately develop a space flight qualified biomedical research and experiment system for use in various spacecraft, and discussion of the earth application of the BIOLABS program and technology as a means for verifying many BIOLABS system elements on earth prior to subsequent flight system development. The experiment categories and major system development goals and methods are examined, along with future health needs and human factor implications. M.V.E.

A74-14587 Spatial and temporal aspects of target detection with visually time-compressed radar displays. L. A. Scanlan and J. M. Staton (Illinois, University, Urbana, Ill.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 25-30. 15 refs. Contract No. F44620-70-C-0105.

Comparison of target detection performance on a standard, time-compressed display with performance on two displays that provide both spatial and temporal target cues. A fourth display providing primarily spatial cues was also included in the comparison. The results indicate that the addition of spatial cues improves the detectability of a target under conditions of high noise and that at least five frames of storage are required for best performance. M.V.E.

A74-14588 Development of a prediction model for dynamic visual inspection tasks. D. Cochran (Nebraska, University, Lincoln, Neb.), J. L. Purswell, and L. Hoag (Oklahoma, University, Norman, Okla.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 31-51. 36 refs.

Review of a series of two experiments using response surface methodology that were conducted to determine the effects of five variables on a dynamic visual inspection task. These variables were: (1) rate of change of the visual angle; (2) angular velocity; (3) time to view; (4) illumination; and (5) contrast. The results showed illumination and contrast to be dominant in determining inspector performance. Time to view, rate of change of the visual angle, and

angular velocity can have significant effects on performance, especially at extreme values. The major outputs of these experiments were four prediction models. These models can help design industrial inspection setups and assist in improving the inspection accuracy of existing inspection facilities. M.V.E.

A74-14589 Beyond linear perspective with computer generated displays. M. L. Ritchie (Wright State University, Dayton, Ohio) and B. J. Shinn (General Electric Co., Daytona Beach, Fla.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 52-55.

A computer-generated display of the forward visual scene from maneuvering aircraft had been connected to a digital flight simulator. Despite the advantages of true linear perspective, full color capability, and a frame rate of 30 per second, there were objections to the use of the display for pilot training. Using only software changes to implement selected perceptual principles, objections to the display were alleviated and its regular use in training facilitated. (Author)

A74-14590 Static TV search for linear-cued targets with different fields of view. M. Freitag and D. B. Jones (Martin Marietta Aerospace, Orlando, Fla.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 69-73, 5 refs.

The search time required by carefully prebriefed operators using a cathode-ray tube to detect bridge and road-intersection targets against realistic backgrounds was investigated as a function of various fields of view under static viewing conditions. Subjects required an average of 3.8 seconds to recognize the targets at fields of view of some 3 to 5 degrees. Target acquisition time increased significantly with increased field of view as did the number of lost or erroneously identified targets. M.V.E.

A74-14591 Biomechanical modeling of the human body. A. Roozbazar (North Carolina State University, Raleigh, N.C.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 181-191, 24 refs. Grant No. PHS-5-TO1-OH-00089.

This review of the currently available literature on the biomechanical models of the human body reveals a biomechanist's approach to the mechanics of the complex human structure. The body consists of a limited number of rigid links. These links articulate at pivots which possess a limited number of degrees of freedom, and are approximated by simple geometrical shapes such as spheres, cylinders, or frustra of right circular cones. The density of these segments is assumed to be homogeneous. At present there exists working data on length, volume, mass, center of mass, mass moment of inertia, and radius gyration of body segments. If the force environment contains such things as vibration, blast, or impact, then the tendency is to represent the body as a linear, lumped parameter system with few degrees of freedom. If biomechanical investigations are coupled with studies on physiological, environmental, and occupational factors, results of these studies can be more fruitful. (Author)

A74-14592 Visual behavior changes of student pilots flying instrument approaches. J. M. Miller (Michigan, University, Ann Arbor, Mich.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 208-214, 18 refs.

Study of visual behavior changes induced in pilot students by instrument landing practice at early and advanced skill development stages. Localizer and glide slope tracking tasks were the specific parts of the ILS approaches used during the measurement of visual and control behavior. For both localizer and glide slope at the higher skill development stage, mean looking times decreased, mean looking rates increased, and both mean and standard deviation of interlook

intervals decreased. Mean looking rates increased with increasing task stress-sensitivity levels. In comparing the two instruments, for the localizer, mean looking rates were greater, the percent of total time was greater, looking rates were higher, and interlook intervals were less than for the glide slope. M.V.E.

A74-14593 Effects of briefing card information on passenger behavior during aircraft evacuation demonstrations. D. A. Johnson and H. B. Altman, Jr. (Douglas Aircraft Co., Long Beach, Calif.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 215-221, 6 refs.

Study of the effect of 'JUMP' and 'JUMP - DON'T SIT' briefing cards upon the jump/sit behavior of 1048 passenger/subjects participating in four large-scale aircraft escape-slide evacuation demonstrations. It was hypothesized that the jumper/sitter ratio would be lowest when passengers had no briefing card; that it would be higher when passengers had a briefing card instructing them to 'JUMP' onto the slide; and highest when passengers had briefing cards telling them to 'JUMP - DON'T SIT.' The hypotheses were confirmed: with no card 59.9% of the passengers jumped; when told only to 'JUMP,' 67.8% of the passengers jumped; and when instructed to 'JUMP - DON'T SIT,' 73.5% jumped. M.V.E.

A74-14594 Effectiveness of video instructions on life jacket donning. D. A. Johnson (Douglas Aircraft Co., Long Beach, Calif.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 223-228, 5 refs.

Review of the results of an experimental evaluation of different instructional techniques by which the naive passenger can be taught to don the current type of life jacket. The results suggest that TV or motion pictures can increase the viewer's ability quickly to don the life jacket. M.V.E.

A74-14600 Varied and fixed error limits in automated adaptive skill training. W. H. Crooks and S. N. Roscoe (Illinois, University, Urbana, Ill.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 272-280, 34 refs. Research supported by the Link Foundation; Contract No. F44620-70-C-0105.

Three strategies for manipulating error limits were compared with a fixed error limit in an adaptive training system. The velocity/acceleration ratio of the control dynamics was the adaptive variable. The results of the study suggest that the employed model of adaptive training is too simplistic to be productive. M.V.E.

A74-14601 Mixed-factor response surface methodology - Central-composite design considerations. C. Clark, L. A. Scanlan, and R. C. Williges (Illinois, University, Urbana, Ill.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 281-288, 18 refs. USAF-sponsored research.

This paper proposes a second-order, central-composite design modification which allows joint consideration of within-subject and between-subjects factors. The modification is merely a series of five-factor, within-subject central-composite designs, repeated across five levels of a sixth, between-subjects, factor, resulting in 135 data points. An illustrative target detection study demonstrated the applicability of the proposed design to a real-world problem area. The data were analyzed via multiple regression procedures, yielding prediction equations relating percent and latency of correct detections to six time-compression variables. Two important considerations are discussed in connection with the proposed design. First, it is apparent that the resulting design is not the most efficient technique for joint consideration of the two factor-types, particularly when

two or more between-subjects factors are to be incorporated. Second, it is desirable to select experimental factor levels to insure that the design itself is orthogonal. (Author)

A74-14602 * Impacts of teleoperation on modern society. A. D. Alexander, III (NASA, Ames Research Center, Moffett Field, Calif.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 299-304.

A survey study of state-of-the-art technology, major civil sector user needs, and recommendations for federal initiatives in the field of teleoperators, robotics, and remote systems is reviewed. Impending developments in the application of teleoperation to remote emergency medical care and to remote mining operations are speculated upon. (Author)

A74-14603 * Human factor roles in design of teleoperator systems. C. Janow (NASA, Office of Life Sciences, Washington, D.C.) and T. B. Malone (Essex Corp., Alexandria, Va.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 305-314. 10 refs.

Teleoperator systems are considered, giving attention to types of teleoperators, a manned space vehicle attached manipulator, a free-flying teleoperator, a surface exploration roving vehicle, the human factors role in total system design, the manipulator system, the sensor system, the communication system, the control system, and the mobility system. The role of human factors in the development of teleoperator systems is also discussed, taking into account visual systems, an operator control station, and the manipulators. G.R.

A74-14604 Man/machine interface considerations for a teleoperator spacecraft control station. R. A. Spencer (Martin Marietta Aerospace, Denver, Colo.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C. October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 326-333. 13 refs.

The effect of man/machine interfaces on free-flying teleoperator control and display station design is studied. The initial interface investigated was the visual interface between the operator and the control console. A hybrid stereo/monoscopic television system was adopted as the most feasible indirect viewing technique. System-imposed requirements were established using Fresnel stereoscopic display technology. It was found that the positioning correlation between the operator's eyes and the stereoscopic Fresnel screen was the single requirement that had the greatest effect on man/machine design compatibility. V.P.

A74-14606 Interaction of the circadian rhythm with the effects of continuous work and sleep loss. B. R. Brown and B. B. Morgan, Jr. (Louisville, University, Louisville, Ky.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 433-439. 12 refs. Grants No. DAHC19-69-C-0009; No. DA-ARO(D)-31-124-71-G109. Project THEMIS.

Studies were conducted to determine the extent to which man's capability for long-term continuous work interacts with the circadian rhythm. The synthetic-work technique has been employed in a series of investigations designed to assess the extent to which performance efficiency is degraded during extended periods of continuous work and sleep loss. Another factor explored was the amount of sleep necessary for the recovery of a normal performance level after the performance had been reduced by the effects of continuous work and sleep loss. G.R.

A74-14607 Operator accuracy in electronic assembly. L. A. Geraty (Anaren Microwave, Inc., Syracuse, N.Y.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 465-468.

The ability of trained electronic assemblers to accurately locate small components while working under microscopic viewing conditions, unassisted by micromanipulators is investigated. The assembly technique and the measurement technique employed are described, and the usefulness of such studies is indicated. V.P.

A74-14608 On the quantification of electromyography. T. M. Khalil and J. E. Otero (Florida, University, Gainesville, Fla.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 505-508. 13 refs. NSF Grant No. GK-37024X.

This paper discusses methods of quantification of electrical signals accompanying muscular activity. Techniques and equipment of recording the signals, known as an electromyogram, are presented and comparisons of the various techniques are made. Experiments show that a properly processed signal can have a large impact on the usefulness of application of electromyography. Easy methods of processing and proper interpretation of signals can result in a much wider use of electromyography in human factors research. (Author)

A74-14609 Implications of visual space perception theory for a long duration space mission. L. Silverstein (Grumman Aerospace Corp., Bethpage, N.Y.). In: Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings. Santa Monica, Calif., Human Factors Society, Inc., 1973, p. 513-518. 35 refs.

A systematic, theoretical rendering of visual space perception was made for the purpose of determining if man's visual system was adequate to the new tasks of space travel. Gestalt, Empirical, Hebbian, Directive State and Sensory-Tonic Theories were examined in terms of the physical manipulation in the attempt to reduce theories to understandability. Disorientation due to loss of visual cues, weightless orbit and lack of tactile pressure sensing suggests that space may provide a unique set of problems. The feasibility of overcoming these visual problems was developed in terms of the astronaut's tasks during a long duration space mission. (Author)

A74-14642 Radiation dosage for lengthy flight in close earth orbit. S. N. Vernov, I. A. Savenko, O. I. Savun, I. N. Senchuro, and P. I. Shavrin. (*Kosmicheskie Issledovaniia*, vol. 11, Mar.-Apr. 1973, p. 321-328.) *Cosmic Research*, vol. 11, no. 2, Sept. 1973, p. 280-285. 27 refs. Translation.

Radiation penetrating into the interior of long-lived earth orbiters is discussed on the basis of data from a large number of Soviet earth orbiters collected since the early 1960's. It is found that the radiation safety requirements are met adequate with radiation shields of 3 g/sq cm for an orbiting time of about one year when the apogee is not above 300 km and the angle of inclination is not above 65 deg. The same conditions are generally valid up to an apogee of 400 km in the absence of artificial charged particle injection (from a high altitude nuclear explosion), while at altitudes of 500 km, the principal contributors to the absorbed radiation doses are the radiation belts. V.Z.

A74-14649 Video scanner-analog computer system for semiautomatic analysis of routine echocardiograms. J. M. Griffith and W. L. Henry (National Institutes of Health, National Heart and Lung Institute, Bethesda, Md.). *American Journal of Cardiology*, vol. 32, Dec. 1973, p. 961-964. 14 refs.

A system has been developed that converts a portion of a standard echocardiographic strip chart record into several separate analog voltages, each representing the motion of an individual cardiac structure. These analog signals are then analyzed by electronic

circuits designed to perform a variety of mathematical operations. The analysis described makes use of a closed-circuit television scanning system. Details of system design are considered together with a system evaluation and clinical applications. G.R.

A74-14713 Biological and medical cybernetics (Biologicheskaya i meditsinskaya kibernetika). Edited by K. A. Ivanov-Muromskii. Kiev, Izdatel'stvo Naukova Dumka (Kibernetika i Vychislitel'naya Tekhnika, No. 21), 1973. 124 p. In Russian.

Topics discussed include the use of bioengineering in the analysis of complex systems, the simulation of individual organs and systems of the human organism, principles of design of neuroengineering and neuroelectronic systems, bioelectric control of motor reactions, mathematical models of medical diagnostic and therapeutic processes and the results of experimental studies of these models with the aid of computers, the results of practical use of medical data systems, and engineering devices for feeding biomedical data into computers.

A.B.K.

A74-14714 # Bioengineering and certain problems in the analysis of complex systems (Biotehnika i nekotorye problemy analiza slozhnykh sistem). K. A. Ivanov-Muromskii and Iu. V. Paramonov. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 3-9. 27 refs. In Russian.

Consideration of various problems involved in the analysis and synthesis of systems containing a biological object as an integral component. A classification of such systems based on the role played by the biological object in the entire control loop is presented. A study is made of a control system including a human operator viewed as a complex and general case of a bioengineering system employing the purposeful behavior of a human organism in an ambient medium. Particular attention is paid in this connection to the key concept of the complexity of a bioengineering system as a whole. In discussing the analysis of the dynamic characteristics of a biological object, a study is made of the problem of estimating the state of an organism from a set of physiological criteria.

A.B.K.

A74-14715 # Determination of the molecular-ion charge and the erythrocyte charge in human blood by Millekan's method (Opredelenie molionnogo zariada i zariada eritrotsitov krovi cheloveka metodom Millikena). K. A. Ivanov-Muromskii and A. I. Likhachev. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 13-15. In Russian.

A74-14716 # Psychophysiological organization of the human memory (Psikhofiziologicheskaya organizatsiya pamiaty cheloveka). G. A. Aminev. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 16-21. 26 refs. In Russian.

Consideration of the psychophysiology of short-term and long-term verbal memory. The results of a statistical treatment of experimental data obtained from subject-computer dialogs are presented. It is maintained that both types of memory are of the same nature and that the temporal and premotor regions of the brain serve as the storehouse of information. It is shown that the focus of maximum activity is displaced from the temporal to the premotor region as the verbal memory is consolidated. It is concluded that during the formation of interverbal communication parallel, duplicate chains of communication neurons are formed not only in one, but in several analysors. Moreover, the functional load on these parallel paths is different in different stages of consolidation of interverbal communication during its displacement from the temporal to the motor region.

A.B.K.

A74-14717 # A mathematical model of the otolithic receptor of the vestibular analyzer (Matematicheskaya model' otolitovogo retseptora vestibuliarnogo analizatora). A. B. Kotova and O. G.

Pustovoi. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 21-24. 7 refs. In Russian.

Elaboration of a hypothesis concerning compensation of gravity forces by elastic forces of the otolithic receptor structure during evolutionary development of the vestibular apparatus. On the basis of this hypothesis a mathematical model of the otolithic receptor is constructed which makes it possible to study the functioning of the otolithic apparatus under normal and altered gravity conditions.

A.B.K.

A74-14718 # Experimental study of the extrapolation reaction (Eksperimental'noe issledovanie reaktsii ekstrapoliatsii). M. Iu. Antonov. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 25-30. 7 refs. In Russian.

Consideration of the problem of studying the special features of the human extrapolation mechanism under conditions of tracking an input signal in the presence of artificial noise. It is shown experimentally that the operator tracking error, which depends on the functioning of the extrapolation mechanism, is directly proportional to the degree of covering of the screen and depends on the interruption of the input signal tracking process. A direct proportional relation is established between the input signal error and the rate of change in the input signal, which confirms the relation between the operator functioning complexity and the velocity parameters of the input signal. Three regions of change in the tracking error as a function of the time of observation of the input signal by the operator are distinguished, and the time intervals in which the extrapolation mechanism operates with different qualities are established.

A.B.K.

A74-14719 # A study of color adaptation of single-component human vision (Issledovanie tsvetovoi adaptatsii odnokomponentnogo zreniia cheloveka). E. P. Putiatin and M. F. Bondarenko. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 30-34. In Russian.

Description of experiments which confirm the presence of a logarithmic dependence in the 'red receiver' of the eye. Experiments involving single-component vision were performed which confirm the possibility of applying previously used mathematical models of adaptation of achromatic vision to a description of single-component adaptation processes and verify the presence of a logarithmic signal transformation in the human eye canal which perceives the color red.

A.B.K.

A74-14720 # Justification of a mathematical model of adaptation of vibration sensitivity of the cutaneous analyzer (K voprosu ob obosnovanii matematicheskoi modeli adaptatsii-vibratsionnoi chuvstvitel'nosti kozhnogo analizatora). G. F. Diubko and V. V. Tishchenko. In: Biological and medical cybernetics.

Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 34-42. In Russian.

Construction of a linear operator model which supports earlier experimental findings regarding the adaptation of the cutaneous analyzer. It is shown that, by using the experimental dependences for the adaptation statics and dynamics, the specific form of the linear operator required in the model can be determined, as well as the form of the kernel of this operator. In particular, it is shown that this kernel must be determined by solving an integral equation which reduces, after a change of variable, to a Volterra equation of the first kind. The latter, by successive differentiation with respect to the parameter and by the introduction of a new kernel, is reduced to a Fredholm equation of the second kind. It is concluded that the constructed mathematical model of adaptation of vibration sensitivity of the cutaneous analyzer well describes the relations between the input and output signals.

A.B.K.

A74-14721 # Algorithms of control systems as indices of biological levels (Algoritmy upravliushchikh sistem kak pokazateli biologicheskikh urovnei). A. A. Bratko and V. V. Vel'kov. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 42-47. 16 refs. In Russian.

Review of the literature regarding control structure in living and nonliving systems. A detailed study is made of the use of the apparatus of information theory in the solution of biological problems, in particular, to determine levels of biosystems. The use of the concept of interaction structure as a criterion for judging biological levels is discussed, as well as the dependence of the interaction process on the nature of the ambient medium and the type of interaction structure. It is shown that, from the standpoint of cybernetics, an interaction structure is none other than a control device which possesses a certain control algorithm. An analysis is made of the problem of the interaction between control algorithms and a hierarchy of control devices. It is concluded that the process of formation of a hierarchy of control algorithms for successive reflection of the actions of an external medium is one of the essential characteristics of levels of development of biosystems. A.B.K.

A74-14722 # A mathematical model of invariant perception and recognition on the basis of transformation groups (Matematicheskaya model' invariantnogo vospriyatiya i opoznaniya po gruppam preobrazovaniy). A. V. Timofeev. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 48-54. 12 refs. In Russian.

Consideration of a mathematical scheme for a learning system to be used for the perception and recognition of image classes which are invariant with respect to transformation groups on the retina. Explicit formulas for invariants to an affine transformation group are obtained, and an estimate is made of the effect of distortions at the level of the retina on these invariants. It is shown that the proposed system can be taught to differentiate images which differ with respect to their transformation groups and to form elementary (including invariant) concepts. A.B.K.

A74-14723 # Certain patterns in the transformation of sensory information in a transmission channel (Nekotorye zakonomernosti preobrazovaniya sensornoi informatsii v kanale peredachi). Iu. V. Paramonov. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 62-66. In Russian.

Consideration of the special features of the spatiotemporal transformation of sensory information in a nerve regarded as a complex communication line consisting of a large number of 'elementary' independent transmission channels. It is shown that during the passage of a given excitation pattern through a nerve a certain redistribution of time delays occurs between the relations in the individual fibers. A.B.K.

A74-14724 # A model of the human neuromuscular apparatus (Model' nervno-myshechnogo apparata cheloveka). L. S. Aleev and S. G. Bunimovich. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 67-71. In Russian.

Consideration of a hypothetical model of the human neuromuscular apparatus constructed on the basis of a series of experiments in which a simultaneous recording was made of the exertion and the evoked electromyogram of the flexor carpi ulnaris. It is shown that during stimulation of the neuromuscular apparatus by signals not greatly exceeding the threshold level excitation occurs as a result of excitation of a reflector arc. The role of 'direct' excitation of efferent fibers and, all the more so, muscle fibers is insignificant. This explains the considerable delay in the starting time of muscle excitation relative to the start of stimulation. A.B.K.

A74-14725 # Determination of the dynamic characteristics of the human neuromuscular apparatus as a bioelectrical control plant (Opredelenie dinamicheskikh kharakteristik nervno-

myshechnogo apparata cheloveka kak ob'ekta bioelektricheskogo upravleniya). L. S. Aleev, S. G. Bunimovich, M. I. Vovk, Iu. S. Korzhinskii, and A. B. Shevchenko. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 71-75. 6 refs. In Russian.

A74-14727 # Discrete algorithms for processing electroencephalograms (Diskretnye algoritmy obrabotki elektroentsefalogramm). I. D. Ponomareva and Iu. G. Pilipenko. In: Biological and medical cybernetics. Kiev, Izdatel'stvo Naukova Dumka, 1973, p. 100-102. In Russian.

A74-14821 # Altitude and pressure suits (Vysotnye i kosmicheskie skafandry). S. M. Alekseev and S. P. Umanskii. Moscow, Izdatel'stvo Mashinostroenie, 1973. 282 p. 110 refs. In Russian.

An attempt is made to generalize the domestic and foreign experience in designing high-altitude and space suits. The physical factors of space flights and the characteristics of the space environment are discussed, and their action on the human organism is examined. The fundamentals of the theory of designing space suits are discussed, and respective calculations are presented. V.P.

A74-14898 Combining human and computer interpretation capabilities to analyze ERTS imagery. J. D. Nichols and W. M. Senkus (California, University, Berkeley, Calif.). In: Management and utilization of remote sensing data; Proceedings of the Symposium, Sioux Falls, S. Dak., October 29-November 1, 1973.

Falls Church, Va., American Society of Photogrammetry, 1973, p. 447-453.

A74-15008 The ultrastructure of the normal human skeletal muscle - A morphometric analysis on untrained men, women and well-trained orienteers. H. Hoppeler, P. Lüthi, H. Claassen, E. R. Weibel, and H. Howald (Bern, Universität, Berne; Eidgenössische Turn- und Sportschule, Magglingen, Switzerland). *Pflügers Archiv*, vol. 344, no. 3, 1973, p. 217-232. 26 refs. Schweizerischer Nationalfonds zur Förderung der wissenschaftlichen Forschung Grant No. 3,561,71.

Muscle biopsies were taken from the middle part of the vastus lateralis muscle of (1) nine men who were regularly involved in endurance training, (2) three sedentary women, and (3) five well trained athletes. Morphometric analysis of 60 electron micrographs per biopsy showed significant differences. It is postulated that an individual's maximum oxygen intake is limited not only by the capacity of the oxygen transport system but also by the oxidative capacity of mitochondria in the skeletal muscles. (Author)

A74-15009 Hemodynamic responses to hypoxia and hyperoxia in calves at sea level and altitude. A. V. Ruiz, G. E. Bisgard, and J. A. Will (Wisconsin, University, Madison, Wis.). *Pflügers Archiv*, vol. 344, no. 4, 1973, p. 275-286. 24 refs. Research supported by the University of Wisconsin; Grant No. PHS-HL-13154.

Hemodynamic studies were done in nine male Holstein calves, born at sea level, and in eight of these calves after 2 and 4 weeks at 3400 m altitude. Cardiac index (CI) decreased significantly as compared to sea level after 2 weeks at altitude and it was further decreased after 4 weeks. This reduction in CI resulted from decreased stroke index (SI) with unchanged heart rate (HR). Mean pulmonary arterial pressure (PAM) rose from 26 mm Hg at sea level to 63 and 74 mm Hg after 2 and 4 weeks at 3400 m, respectively. During acute severe hypoxia at sea level, CI remained essentially unchanged, while SI and HR, respectively, decreased and rose significantly; PAM was double the normoxic value. Acute hypoxia after 4 weeks at 3400 m did not elicit significant changes in blood gases and pH, CI, SI and HR while PAM increased by 25 mm Hg. There were slight reductions in CI, SI, HR and PAM during acute hyperoxia at sea level. Hyperoxia after 4 weeks at altitude did not change CI, while SI rose significantly. (Author)

A74-15069 Pressurization with nitrogen as an extinguishant for fires in confined spaces. P. A. Tatem, R. G. Gann, and H. W. Carhart (U.S. Navy, Naval Research Laboratory, Washington, D.C.). *Combustion Science and Technology*, vol. 7, no. 5, 1973, p. 213-218. 15 refs. Navy-supported research.

Pressurization with nitrogen has been studied as a technique for suppressing fires in confined spaces. Liquid hydrocarbon-air fires of various sizes in a gastight experimental chamber were extinguished in approximately 30 seconds by increasing the total pressure of the enclosure from 1 atm to 1.35 plus or minus 0.03 atm. The post-fire atmospheres were found to contain sufficient oxygen for support of normal human activity, while the buildup of hazardous combustion products was well below established safety levels. (Author)

A74-15093 Life on Jupiter. C. Ponnamperuma and P. Molton (Maryland, University, College Park, Md.). *New Scientist*, vol. 60, Dec. 6, 1973, p. 692, 693.

The concept of Jupiter as an enormous chemical laboratory is interesting in itself, but it also has far-reaching implications. As many of the simple amino acids which are components of living systems on the earth could be present in the aqueous cloud layers of Jupiter (where, by current estimates, a temperature of 25 C and a pressure of below 10 atm may pertain) the possibility of indigenous Jovian life arises. Terrestrial laboratory experiments, and the evolutionary interrelationships between widely diverse organisms, both past and present, incline researchers favorably toward the hypothesis of chemical evolution. This is believed to have happened on the primordial earth under reducing conditions, similar in many ways to present-day circumstances on Jupiter. If chemical evolution is occurring in Jupiter's atmosphere today this could have advanced to the stage at which life has appeared. F.R.L.

A74-15113 # Improved estimation of the coarseness of ergatic control systems (Utochnene otsiniuvannia 'grubosti' ergatichnikh sistem keruvannia). V. V. Pavlov and V. S. Khominich. *Avtomatika*, vol. 18, Sept.-Oct. 1973, p. 69-72. In Ukrainian.

A current problem in the theory of ergatic (man-machine) control systems involves the proper (optimal from the viewpoint of performance quality) division of functions between the human operator and the machine. The purpose of numerical analyses of system characteristics is the optimization of the system with respect to the extent of human participation in control processes. Attention is given to the use of L(t, u) functions, defined by Krasnoselski et al. (1969), which provide direct upper-bound estimates of the convergence of solutions for two systems of differential equations describing the mathematic model of the system and the state of a real system. A procedure for deriving L(t, u) functions of improved accuracy is described, and the use of these functions in the analysis of man-machine control systems is demonstrated. T.M.

A74-15116 * Very long chain fatty acids in yeast. J. W. Welch and A. L. Burlingame (California, University, Berkeley, Calif.). *Journal of Bacteriology*, vol. 115, July 1973, p. 464-466. Grant No. NGR-05-003-003.

Novel fatty acids ranging from 20 to 30 carbons have been found in *Saccharomyces cerevisiae*. These comprise 1 to 2% of the total fatty acid fraction. (Author)

A74-15122 * Dietary carbohydrate increases brain tryptophan and decreases serum-free tryptophan. B. K. Madras, E. L. Cohen, J. D. Fernstrom, F. Larin, H. N. Munro, and R. J. Wurtman (MIT, Cambridge, Mass.). *Nature*, vol. 244, July 6, 1973, p. 34, 35. 15 refs. Research supported by the John A. Hartford Foundation, PHS, and NASA.

A74-15134 * Response time in the full visual field. R. F. Haines (NASA, Ames Research Center, Neurosciences Branch, Moffett Field, Calif.) and K. Gilliland (California State University,

San Jose, Calif.). *Journal of Applied Psychology*, vol. 58, Dec. 1973, p. 289-295. 21 refs.

Seven male volunteers were administered a binocular peripheral visual response time task to determine response time to small (45 min of arc), white, flashed photopic stimuli. These stimuli were located 10 deg of arc apart from 10 to 90 deg of arc from the fovea along each of eight retinal meridians, each 45 deg of arc apart around the 360 deg. Peripheral visual response time was thus measured at 72 locations in the full visual field and was found to exhibit relatively concentric (almost twice as wide as high) regions of the retina, each region having an equal mean response time. Two examples show how these data can be used in the design of an aircraft instrument panel and cockpit window. T.M.

A74-15135 Prediction of advanced level aviation performance criteria from early training and selection variables. R. M. Bale, G. M. Rickus, Jr., and R. K. Ambler (U.S. Naval Aerospace Medical Center, Aerospace Medical Research Laboratory, Pensacola, Fla.). *Journal of Applied Psychology*, vol. 58, Dec. 1973, p. 347-350. 8 refs.

The criterion of success versus failure in undergraduate flight training has permitted cost effective estimates of the probability of an applicant or student completing naval flight training. However, a prediction problem remains for some designated aviators who are not successful in the replacement air group (RAG), or, postgraduate, phase of instruction. This study employed multiple correlation analysis to examine RAG completion as a remote criterion variable. Undergraduate training grades significantly predicted RAG completion. Had the obtained regression weights been employed, the attrition rate of a cross-validation sample would have been reduced by 33.8%. Those skills in undergraduate training that are 'mission oriented' as opposed to academic or flight skills contributed the most to the explained criterion variance. (Author)

A74-15136 Dimensional analysis of attitudes toward commercial flying. A. Perry (Tel Aviv University, Tel Aviv, Israel) and S. T. Friedman (Texas, University, Austin, Tex.). *Journal of Applied Psychology*, vol. 58, Dec. 1973, p. 388-390.

A factor analysis of responses by 355 students on a 50-item questionnaire concerning attitudes toward aviation and flying yielded 14 identifiable factors. Some of these factors were found related to flying experience and to sex of the respondent. (Author)

A74-15305 # Deformability and strength of compact bony tissue in torsion (Deformativnost' i prochnost' kompaktnoi kostnoi tkani pri kruchenii). I. V. Knets, G. O. Pfafrod, Iu. Zh. Saulgozis, Ia. B. Laizan, and Kh. A. Ianson (Akademiia Nauk Latviskoi SSR, Institut Mekhaniki Polimerov, Riga, Latvian SSR). *Mekhanika Polimerov*, Sept.-Oct. 1973, p. 911-918. 10 refs. In Russian.

The behavior of the deformation and strength characteristics of compact bony tissue subjected to torsion is studied at various cross sections of the human tibia. A relationship between the specific strain energy dissipated during the loading process and the resulting stress level is derived. The correlation between the deformation and strength properties of bony tissue and the concentrations of some biochemical substances contained in it is examined. V.P.

A74-15411 # On the unitary nature of cardiac vibrations. A. A. Luisada (Chicago Medical School, Chicago; Oak Forest Hospital, Oak Forest, Ill.), L. P. Feigen, and K. Mori. *Japanese Heart Journal*, vol. 14, Sept. 1973, p. 406-413. 6 refs.

An investigation was conducted with ten healthy human subjects and five dogs. The slow deflections of the observed apex cardiogram were found to be gradually attenuated by filters. The first derivative of the apex cardiogram produces a graph which is similar to phonocardiograms recorded with minimal filtration for the low frequencies. Graphs obtained in the case of second and third derivatives have almost the aspects of a phonocardiogram recorded in the medium or high frequency bands. G.R.

A74-15426 Membrane fatty acids associated with the electrical response in visual excitation. R. M. Benolken, T. G. Wheeler (Texas, University, Houston, Tex.), and R. M. Benolken (Baylor University, Houston, Tex.). *Science*, vol. 182, Dec. 21, 1973, p. 1253, 1254. 10 refs. NSF Grant No. GB-33499; Grants No. NIH-EY-00244; No. NIH-EY-00871.

A second generation of rats on a modified fat-free diet was raised. Fatty acid distributions of photoreceptor membranes from these animals were altered substantially. Normal electroretinograms (ERG's) were used to test visual function. The ERG data from test and control animals are summarized in a graph. In general, a-wave amplitudes from eyes with modified membranes were uniformly less than those from eyes with normal membranes, while b-wave amplitudes were similar until stimulus values approached saturation. G.R.

A74-15505 # Changes of certain biochemical indices in female dogs after exclusion of the gonad function under high-altitude conditions (Izmenenie nekotorykh biokhimicheskikh pokazatelei u sobak-samok posle vyklucheniia funktsii gonad v usloviakh vysokogor'ia). N. B. Bendiev and I. I. Agabekova (Tadzhikskii Gosudarstvennyi Meditsinskii Institut, Tadzhik SSR). *Akademiia Nauk Tadzhikskoi SSR, Doklady*, vol. 16, no. 7, 1973, p. 71-74. 8 refs. In Russian.

A74-15537 # Simulation of circulatory system reactions to altered body position by means of negative pressure applied to the legs (Modelirovanie reaktsii sistemy krovoobrashcheniia, voznika-iushchikh pri izmeneniiakh polozenii tela, s pomoshch'iu vozdeist-viia otritsatel'nogo davleniia na nogi). Iu. M. Stoida, M. A. Abrikosova, and Iu. D. Pometov (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Oct. 1973, p. 17-20. 23 refs. In Russian.

A74-15538 # Influence of adaptation to high-altitude hypoxia on serotonin concentration in cerebral structures of rats (Vliianie adaptatsii k vysoknoi gipoksii na kontsentratsiiu serotonina v struktural'nykh golovnogo mozga krysy). S. V. Rutsai and F. Z. Meerson (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Oct. 1973, p. 35, 36. 8 refs. In Russian.

A74-15539 # Tensility of the low pressure system following burn shock (Rastiazhimost' sistemy nizkogo davleniia pri ozhogovom shoke). N. A. Len'kova (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Oct. 1973, p. 37-40. 26 refs. In Russian.

Using control and burn-shocked rabbits, the relation between the central venous pressure (CVP) and the circulating blood volume (CBV) was investigated following artificial CVP increase through administration of polyglucin. Responses to polyglucin administration varied as follows: CVP increased in all control rabbits; among burn-shocked rabbits, one subgroup responded by the same CVP increase as that of the control rabbits, another subgroup by a far greater CVP increase, whereas the rest of the rabbits making up the third subgroup showed no CVP increase at all. M.V.E.

A74-15540 # Interaction of ascending and hypothalamic stimuli at neurons of the midbrain reticular formation (Vzaimodeistvie voskhodiaschchikh i gipotalamicheskikh vlianii na neironakh mezentsefalicheskoi retikuliarnoi formatsii). V. G. Zilov (I Moskovskii Meditsinskii Institut, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Nov. 1973, p. 3-5. 23 refs. In Russian.

A74-15541 # Dynamics of the level of impedance of a tissue area between active electromyographic electrodes in a regimen of vestibular tension (Dinamika urovnia impedansa uchastka tkani

mezdu aktivnymi elektromiograficheskimi elektrodami v rezhime vestibuliarnogo napriazheniia). I. F. Golovko (Ministerstvo Zdravookhraneniia SSSR, Vsesoiuznyi Nauchno-Issledovatel'skii i Ispytatel'nyi Institut Meditsinskoi Tekhniki, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Nov. 1973, p. 9-11. 12 refs. In Russian.

A74-15542 # Quantitative assessment of the homeostatic properties of the oxygen transport system (O koличestvennoi otsenke gomeostaticeskikh svoistv sistemy transporta kisloroda). L. A. Dartau (Institut Problem Upravleniia, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 76, Nov. 1973, p. 11-14. 13 refs. In Russian.

For a quantitative assessment of the homeostatic properties of the oxygen transport system, it has been proposed to compare shifts in the state of the system with the magnitude of shift-inducing forces. An experiment aimed at obtaining such an assessment was conducted, using a mathematical model of the respiration, circulation, and energy-exchange systems with the aid of a digital computer. The results include the finding that the quantitative indices of homeostatic properties vary as a function of the prevailing stress conditions (i.e., rest or physical load). In the presence of a physical load, when regulation mechanisms are under stress, the homeostatic capacity of the system deteriorates. M.V.E.

A74-15601 Effect of propranolol on myocardial oxygen consumption and its hemodynamic correlates during upright exercise. C. R. Jorgensen, K. Wang, Y. Wang, F. L. Gobel, R. R. Nelson, and H. Taylor (Minnesota, University; U.S. Veteran Administration Hospitals, Minneapolis, Minn.). *Circulation*, vol. 48, Dec. 1973, p. 1173-1182. 41 refs. Research supported by the Minnesota Heart Association and Ober Charitable Foundation; Grant No. PHS-5-T01-HL-06314-12.

Experimental evaluation of the ability of easily measured hemodynamic variables to provide a basis for the prediction of the myocardial blood flow and myocardial oxygen consumption in the presence of marked alterations in contractility induced by beta-adrenergic blockade with propranolol. The results obtained include the findings that the heart rate-blood pressure product is a good index of myocardial metabolic needs during exercise and that the relationship is undistorted by marked changes in contractility, but that the tension-time index is a poor correlate. M.V.E.

A74-15602 Visualization of ventricular septal defects by cardiac ultrasonography. D. L. King, C. N. Steeg, and K. Ellis (Columbia University, New York, N.Y.). *Circulation*, vol. 48, Dec. 1973, p. 1215-1220. 7 refs.

Anatomically true cross-sectional ultrasonic images of the heart have demonstrated ventricular septal defects in 25 patients with this lesion as an isolated anomaly or in conjunction with other defects. In two additional patients a defect was visualized but confirmation was not obtained. Ventricular septal defects were not demonstrated in 13 other patients in whom this lesion was identified by other techniques. In these instances the lesion was not sought for, was inaccessible, or was too small to image. Defects were manifested by the septum overriding the posterior great artery, septal discontinuity immediately below the posterior semilunar valve, or a discontinuity caudal to the posterior semilunar valve. It appears that cardiac ultrasonography may be able to demonstrate most of the common larger ventricular septal defects occurring in the infracristal region of the septum. (Author)

A74-15603 Diagnosis of obstructive coronary disease by maximal exercise and atrial pacing. M. H. Kelemen, R. E. Gillilan, R. J. Bouchard, R. L. Heppner, and J. R. Warbasse (U.S. Public Health Service, Hospital, Baltimore, Md.). *Circulation*, vol. 48, Dec. 1973, p. 1227-1233. 22 refs. Grant No. PHS-AY-72-15.

Experimental assessment of the usefulness of maximal exercise testing and atrial pacing in the clinical evaluation of patients referred to a cardiac unit with chest pain. Special attention to the evaluation

of symptoms experienced during and immediately after maximal exercise and atrial pacing, as well as to the electrocardiographic changes that occur, is emphasized. M.V.E.

A74-15604 Potassium-43 myocardial perfusion scanning for the noninvasive evaluation of patients with false-positive exercise tests. B. L. Zaret, R. E. Stenson, N. D. Martin, H. W. Strauss, H. P. Wells, Jr., R. L. McGowan, and M. D. Flamm, Jr. (USAF, David Grant Medical Center, Travis AFB, Calif.). *Circulation*, vol. 48, Dec. 1973, p. 1234-1241. 25 refs. USAF-supported research.

A74-15605 Cesium-129 myocardial scintigraphy to detect myocardial infarction. D. W. Romhilt, R. J. Adolph, V. J. Sodd, N. I. Levenson, L. S. August, H. Nishiyama, and R. A. Berke (Cincinnati, University, Cincinnati, Ohio; U.S. Navy, Naval Research Laboratory, Washington, D.C.). *Circulation*, vol. 48, Dec. 1973, p. 1242-1251. 24 refs. Research supported by the Southwestern Ohio Heart Association; Grants No. NIH-NHLI-71-2489; No. PHS-HE-6307.

The development of good quality cesium-129 myocardial images and the application of this technique to the recognition of myocardial infarction (MI) in animals and patients are described. The good quality of the myocardial images obtained strongly suggest the potential usefulness of the technique in the quantification of acute MI. M.V.E.

A74-15646 # Central apparatuses and mechanisms of viscerosomatic integration (Tsentral'nye apparaty i mekhanizmy vistsero-somaticheskoi integratsii). V. S. Raitses (Meditsinskii Institut, Ivano-Frankovsk, Ukrainian SSR). *Uspekhi Fiziologicheskikh Nauk*, vol. 4, Oct.-Dec. 1973, p. 90-107. 127 refs. In Russian.

Extensive review of Soviet and non-Soviet papers concerning the subjects, with the emphasis on applications of electrophysiological methods to studies of the visceromotor reflex. The functional organization of the visceral and somatic afferent systems and their interactions at various levels of the central nervous system are also covered as well as the role of visceral afference in motor activity disorders. V.Z.

A74-15647 # Inhibition and inhibitive neurons in the visual cortex (O tormozhenii i 'tormoznykh' neuronakh v zritel'noi kore). S. N. Khaiutin (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Uspekhi Fiziologicheskikh Nauk*, vol. 4, Oct.-Dec. 1973, p. 108-141. 151 refs. In Russian.

Literature data and the author's findings are used as a basis for the evaluation of the functional role of C-neurons in the visual cortex. It is concluded that these neurons cannot be classed as inhibitive interneurons and are a modification of a group of typical visual cortex neurons (B-neurons). The occurrence of C-neurons, as identified in Young's classification, is linked to the functional state of the organism and may reflect those sensory stimulator parameters which are most suitable for response activation in a given functional state. V.Z.

A74-15648 # Carbohydrate metabolism and its regulation during hypothermia (Obmen uglevodov i ego regulatsiia pri gipotermii). V. A. Bernshtein (Institut Fizkul'tury, Malakhovka, USSR). *Uspekhi Fiziologicheskikh Nauk*, vol. 4, Oct.-Dec. 1973, p. 142-159. 121 refs. In Russian.

Published papers and some of the author's studies concerning the effects of hypothermia on various phases of carbohydrate metabolism in the organism are reviewed. Particular attention is given to the changes in blood glucose contents and liver glycogen contents during hypothermia. The role of internal secretion glands in carbohydrate metabolism in the brain, heart, kidneys and skeletal muscles is discussed. V.Z.

A74-15649 * Swimming compared to cold for eliciting maximal oxygen uptake in mice. R. M. Glaser (Wright State University, Dayton, Ohio) and H. S. Weiss (Ohio State University,

Columbus, Ohio). *Society for Experimental Biology and Medicine, Proceedings*, vol. 144, Dec. 1973, p. 749-752. 10 refs. Grant No. NGR-36-008-004.

A74-15650 * Circadian timing of single daily 'meal' affects survival of mice. W. Nelson, L. Cadotte, and F. Halberg (Minnesota, University, Minneapolis, Minn.). *Society for Experimental Biology and Medicine, Proceedings*, vol. 144, Dec. 1973, p. 766-769. 25 refs. Research supported by the Cereal Institute and NASA; Grant No. PHS-5-K6-GM-13891.

It is shown that the survival of young mice after abrupt restriction to a single 4-hr span of daily food accessibility can depend on the temporal placement of this feeding span in relation to the lighting regimen. Housing conditions are an important codeterminant of this response. M.V.E.

A74-15651 * Inactivation of human interferon by body fluids. T. C. Cesario (Boston City Hospital, Boston, Mass.), A. Mandell (Harvard University, Boston, Mass.), and J. G. Tilles (California, University, Irvine, Calif.). *Society for Experimental Biology and Medicine, Proceedings*, vol. 144, Dec. 1973, p. 1030-1032. NASA-supported research; Grants No. NIH-5-R01-A1-01695; No. NIH-2-T01-A1-0068.

Description of the effects of human feces, bile, saliva, serum, and cerebrospinal fluid on interferon activity. It is shown that crude interferon is inactivated by at least 50% more than with the control medium used, when incubated for 4 hr in vitro in the presence of serum, saliva, or cerebrospinal liquid, and by close to 100% when incubated with stool extract or bile. M.V.E.

A74-15746 # Human operator dynamics in a two-variable system. N. Goto (Kyushu University, Fukuoka, Japan). *Japan Society for Aeronautical and Space Sciences, Transactions*, vol. 16, no. 33, 1973, p. 160-172. 14 refs.

Human operator dynamics in a two-variable control system has been studied both theoretically and experimentally, in terms of frequency response characteristics. Scanning or sampling, one of the unique factors exhibited by the human operator has been taken into consideration. The study has shown that the scanning brings about mainly a decrease in gain level of the human operator, and that the human operator dynamics in a two-variable control system can be quantitatively assessed from the so far obtained single-variable control system data. (Author)

A74-15749 Evaluation of hypothalamic thermosensitivity by feedback signals. C. Jessen (Max-Planck-Institut für physiologische und klinische Forschung, Bad Nauheim, West Germany) and D. P. Clough (Giessen, Universität, Giessen, West Germany). *Pflügers Archiv*, vol. 345, no. 1, 1973, p. 43-59. 23 refs.

Experiments with goats carrying chronically implanted hypothalamic thermodes show that hypothalamic cooling results in an elevation of rectal temperature, while hypothalamic heating causes a fall in temperature. The relation between the intensity of hypothalamic thermal stimulation and the induced change in core temperature lends itself to description by linear regressions. M.V.E.

A74-15750 Effect of arterial hypoxia on myocardial oxygen consumption. E. R. Powers and W. J. Powell, Jr. (Massachusetts General Hospital; Harvard University, Boston, Mass.). *Circulation Research*, vol. 33, Dec. 1973, p. 749-756. 20 refs. Grant No. PHS-HL-14292; Contract No. PHS-43-67-1443.

Evaluation of the effect of arterial hypoxia on myocardial oxygen consumption, under controlled conditions of stable or decreased contractility and tension, performed upon anesthetized, adrenergically blocked dogs. The results indicate that arterial hypoxia leads to an increase in myocardial oxygen consumption and a decrease in myocardial efficiency. M.V.E.

A74-15955 # A possibility of closed-loop control analysis of blood pressure in experimental and clinical studies (Eine Möglichkeit regelphysiologischer Blutdruckanalysen in experiment und Klinik). U. Zwiener (Nervenklinik, Erfurt, East Germany). *Acta Biologica et Medica Germanica*, vol. 31, no. 4, 1973, p. 561-568. 36 refs. In German.

Description of a concept of closed-loop control analysis of human blood pressure and pulse rate. A measurement arrangement for closed-loop blood pressure analysis is described in which the arterial blood pressure and its mean pressure, as well as the pulse rate and respiration before, during, and after orthostatic loading, are continuously indicated, and transient phenomena are mathematically defined - all this being accomplished by bloodless recording on the relaxed vessel wall. A.B.K.

A74-16001 An analysis of the mechanical capabilities of heart muscle during hypoxia. A. H. Henderson and D. L. Brutsaert (Antwerp, Rijksuniversitair Centrum, Antwerp, Belgium). *Cardiovascular Research*, vol. 7, Nov. 1973, p. 763-776. 31 refs.

A74-16002 Effect of intermittent altitude hypoxia on the myocardium and lesser circulation in the rat. J. Widimsky, D. Urbanova, J. Ressler, B. Ostadal, V. Pelouch, and J. Prochazka (Czechoslovak Academy of Sciences, Institute for Clinical and Experimental Medicine and Institute of Physiology, Prague, Czechoslovakia). *Cardiovascular Research*, vol. 7, Nov. 1973, p. 798-808. 43 refs.

The effect of intermittent altitude hypoxia on the myocardium and lesser circulation was investigated in 58 rats. The altitude hypoxia was produced with a low pressure chamber (7,000 m, five days a week, four hours daily). This type of intermittent altitude hypoxia led to right ventricular hypertrophy in all animals after 24 exposures. A chronic pulmonary hypertension of a moderate degree was found even after intermittent altitude hypoxia (75 exposures). In this study, histological changes (focal necroses in both left and right ventricle) were observed. (Author)

A74-16003 A digital computer model of the vectorcardiogram - A design permitting the simulating of abnormal conduction in the ventricles. J. R. Palmer, K. H. McLean, and T. S. Dillon (Monash University, Melbourne, Australia). *Cardiovascular Research*, vol. 7, Nov. 1973, p. 849-858. 19 refs.

A74-16011 Automated system for testing visual fields. G. B. B. Chaplin, J. H. Edwards, J. L. Gedye, and S. Marlowe (Essex, University, Colchester, Essex, England). *Institution of Electrical Engineers, Proceedings*, vol. 120, Nov. 1973, p. 1321-1327. 13 refs.

An electronic system for automatically testing the human visual field is described in the context of mass screening for visual disorders, such as glaucoma. Present methods of field testing are briefly reviewed. The new system is patient operated and uses a television monitor as the means for presenting the test stimuli and displaying the results. A multilevel map of a patient's retinal sensitivity is produced in a form which is readily interpreted by an ophthalmologist. A data-transfer unit enables the local storage of results and allows direct access to a computer. Preliminary clinical trials show good agreement with conventional field-testing methods, and yield more detailed information than has hitherto been feasible on a routine basis. (Author)

A74-16032 Auditory distance perception and the problem of 'in-head localization' of sound images (Entfernungshören und das Problem der Im-Kopf-Lokalisierung von Hörereignissen). P. Laws (Rheinisch-Westfälische Technische Hochschule, Aachen, West Germany). *Acustica*, vol. 29, Nov. 1973, p. 243-259. 77 refs. In German.

Results of sound pressure measurements carried out by means of a probe microphone in the ear canals of a number of subjects which were stimulated in an anechoic room by loudspeakers or headphones.

It is noted that the sound pressure signals at the eardrums, compared with the electrical signals at the input of the stimulated system, show linear distortions (attenuation and group delay) which for each investigated stimulating system depend characteristically on frequency. Furthermore, the results of hearing experiments are presented in which subjects stimulated, as before, by loudspeakers or headphones in anechoic space were asked to judge the distances of the sound images occurring. The most important results show that it is possible in the case of headphone reproduction to reduce considerably the enhanced relative frequency of 'in back outside the head' or 'in-head' judgements characterizing a given headphone and to increase simultaneously the relative frequency of 'in front outside the head' judgements. (Author)

A74-16057 Ballistocardiography: Research and computer diagnosis; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972. Meeting sponsored by the Ballistocardiograph Research Society. Edited by E. K. Franke (Cincinnati, University, Cincinnati, Ohio). Basel, S. Karger AG (Bibliotheca Cardiologica, No. 32), 1973. 126 p. \$15.50.

Automatic computer processing of ultralow-frequency ballistocardiograms, a large-scale model of the human cardiovascular system, and simulation of the contribution of the heart to the human ballistocardiogram are among the topics covered in papers concerned with ballistocardiographic research and computer diagnosis. Other topics covered include the ballistographic relationship to hemodynamics of valvular aortic stenosis, cardiac weakness and incoordination in a large population of ambulatory cardiac patients, and cardiac function during Cheyne-Stokes respiration.

M.V.E.

A74-16058 Automatic computer processing of ultralow frequency ballistocardiograms. W. H. Bancroft, Jr., M. Tucker, D. H. Jackson, and E. E. Eddleman, Jr. (U.S. Veterans Administration Hospital; Alabama, University, Birmingham, Ala.). In: Ballistocardiography: Research and computer diagnosis; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972. Basel, S. Karger AG, 1973, p. 1-10. 6 refs. Research supported by the U.S. Veterans Administration; Grants No. PHS-HE-11310; No. PHS-5-P07-RR-00145-09.

Description of a method of rapid computer-aided ballistocardiogram processing developed for use of recorded signals on analog magnetic tape or with data coming directly from a patient. For a group of 24 patients, each with two to three complexes available, the I-J amplitudes were measured by hand and by computer. The correlation coefficient between the two was 0.985.

M.V.E.

A74-16059 Computer preprocessing of ballistocardiograms. I. Tomek (Alberta, University, Edmonton, Alberta, Canada). In: Ballistocardiography: Research and computer diagnosis; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972. Basel, S. Karger AG, 1973, p. 11-14.

Description of an approach to computerized preprocessing of ballistocardiograms (Bcg) differing from other methods in two respects: (1) it is completely automatic; and (2) individual Bcg waveforms in each record are grouped into sets of similar patterns. The last feature makes it possible to obtain one or several patterns 'typical' for a given record. These typical patterns can either be stored to become members of a library of typical Bcg's or used for computerized classification of a given record by comparison with a library of normal and abnormal Bcg's.

M.V.E.

A74-16060 A large-scale model of the human cardiovascular system and its application to ballistocardiography. D. M. Auslander (California, University, Berkeley, Calif.), T. E. Lobdell (GM Technical Center, Warren, Mich.), and D. Chong (General Electric Co., San Jose, Calif.). In: Ballistocardiography: Research and computer diagnosis; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972. Basel, S. Karger AG, 1973, p. 15-21. 10 refs. NIH-supported research.

A74-16061 The ballistocardiographic relationship to the hemodynamics of valvular aortic stenosis. D. H. Jackson, M. Tucker, W. H. Bancroft, Jr., and E. E. Eddleman, Jr. (Alabama, University; U.S. Veterans Administration Hospital, Birmingham, Ala.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 26-36. 7 refs.
Grants No. PHS-HE-11310; No. PHS-5-PO7-RR-00145-09.

Study of data available on patients with valvular aortic stenosis (VAS) aimed at defining relationships that may make possible an input of additional data into initial or follow-up clinical evaluations of VAS patients without necessity of invasive studies. The results obtained include the findings that there are numerous strong correlations between individual ballistocardiographic measures and hemodynamic measures, and that it is not yet possible to predict individual hemodynamic variables with acceptable accuracy. M.V.E.

A74-16062 Effects of hypertension on high-frequency /acceleration/ direct body ballistocardiography. N. J. Winer (Lenox Hill Hospital, New York, N.Y.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 50-57. 27 refs. Research supported by the Florence G. Heller Foundation and Xerox Corp.

Hypertension effects on the form of ballistocardiogram patterns, as recorded by high-frequency (acceleration) direct body ballistocardiography consistent with physiologic principles, are illustrated using patients serving as their own controls. The dominant alterations are those of diminished amplitude and shift in pattern form from a 'normal' HIJ relation in the normotensive phase to one of early 'H'-accentuated J(R) in the hypertensive phase. M.V.E.

A74-16063 Physiologic expressions of cardiac dynamics by high-frequency /acceleration/ direct body ballistocardiography. N. J. Winer (Lenox Hill Hospital, New York, N.Y.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 58-71. 32 refs.
Research supported by the Florence G. Heller Foundation and Xerox Corp.

It is shown that the high-frequency direct body ballistocardiogram does reflect cardiac dynamics in terms of physiologic principles affirmed by other recognized methods. The physiologic expressions are presented in the context of three basic groups: (1) electrical or conductivity effects; (2) effects of preload and afterload; and (3) contractility. M.V.E.

A74-16064 Determination of cardiac state. S. Fich, B. Min, W. Welkowitz (Rutgers University, New Brunswick, N.J.), D. Jaron, and A. Kantrowitz (Sinai Hospital, Detroit, Mich.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 72-82. 11 refs.
Research supported by Rutgers University; Grant No. PHS-HE-11173.

This paper presents a method for determining cardiac state from in vivo measurements of pressure and flow under two conditions of after-loading. The left ventricle is modeled as a pressure source having an internal impedance. It is shown that the parameters of the pressure source are related to the heart muscle parameters. Stress-length variations under conditions of drug induced nerve blockage and simulated heart failure are calculated. Evaluation of the muscle parameters may have practical value in assessing cardiac state.

(Author)

A74-16065 The HI slope of the ballistocardiogram used to compute indices of myocardial contractility in man. J. Baan (Pennsylvania, University, Hospital, Philadelphia, Pa.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 83-93. 15 refs.
Grant No. NIH-HE-08805.

Two mathematical relationships between the HI slope of ballistocardiograms and maximal flow acceleration and pressure derivative in the ascending aorta, which had been derived previously were tested in 17 patients during cardiac catheterization. Experimental data were found to fit the mathematical predictions very well, though some limitations are indicated. It is concluded that ballistocardiography represents a noninvasive tool for quantitative assessments of myocardial contractility. M.V.E.

A74-16066 An inherently damped ULF ballistocardiograph. D. M. Cunningham and T. L. Mossteller (California, University, Berkeley, Calif.). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 101-108.

The basic relationships between the bearing load, geometry, fluid properties, damping factor, clearance, fluid pressure, load capacity, and fluid flow rate in an inherently damped ultralow frequency ballistocardiograph are reviewed. By controlling the flow rate of a viscous lubricating oil, variable horizontal damping is shown to be achievable by means of three dished supporting thrust bearings. The proposed system, operated by an oil pump and an oil-recirculating circuit, needs only an external electric power source and is otherwise completely self-contained. M.V.E.

A74-16067 Relationships between the quantitative ballistocardiographic characteristics and the functional indices at graduated work load. Z. Trefny, V. Seliger, and S. Bartunkova (Karlova Univerzita, Prague, Czechoslovakia). In: *Ballistocardiography: Research and computer diagnosis*; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972.

Basel, S. Karger AG, 1973, p. 115-119.

A74-16102 * Skylab medical experiments program. R. R. Hessberg (NASA, Office of Life Sciences, Washington, D.C.). In: *Technology today and tomorrow*; Proceedings of the Tenth Space Congress, Cocoa Beach, Fla., April 11-13, 1973.

Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1973, p. 1-1 to 1-8.

With the completion of the historic Apollo Program, the significant medical findings will be reviewed and the medical results summarized. The medical objectives of Skylab will be presented. The medical experiments which will be conducted and their relationship to the Apollo medical findings and Skylab objectives will be discussed. The interrelationship of the Skylab medical experiments will be described and the anticipated information to be obtained will be postulated. (Author)

A74-16106 * Evaluation of an artificial estuarine habitat-initial stage. P. Poonai (Bethune-Cookman College, Daytona Beach, Fla.). In: *Technology today and tomorrow*; Proceedings of the Tenth Space Congress, Cocoa Beach, Fla., April 11-13, 1973.

Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1973, p. 2-13 to 2-17. 21 refs. NASA-supported research.

In order to study the influence of an artificial habitat of discarded automobile tires upon the biomass in and around it, three sites were selected in the Banana River of which two will contain small groups of tires and one will not. Over a given period, the populations in and around the tires will be compared with those which existed initially or prevail on the natural site. Preliminary observations indicate that adequate numbers may be present in the lower trophic levels but that there are perhaps inadequate populations of upper level carnivores which it appears can be increased by an artificial habitat. (Author)

A74-16126 * Bio-medical electrical disconnects. W. E. Parsons (NASA, Design Engineering Directorate, Kennedy Space Center, Fla.). In: Technology today and tomorrow; Proceedings of the Tenth Space Congress, Cocoa Beach, Fla., April 11-13, 1973. Cape Canaveral, Fla., Canaveral Council of Technical Societies, 1973, p. 8-15 to 8-20.

Improvements in medical care during the last two decades have resulted in the survival of an ever-increasing group of patients with severe neuro-muscular disabilities who otherwise would have succumbed to their diseases or injuries. This has created a sizeable population of severely paralyzed persons totally dependent upon society for care. It has been estimated that this population may grow beyond 5,000,000 persons by 1980. A rather fortunate confluence of complementing technologies and surgical techniques offer promise of solving this growing socially significant problem. (Author)

A74-16130 Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Symposium sponsored by the International Centre for Mechanical Sciences and International Federation for the Theory of Machines and Mechanisms. Udine, Italy, International Centre for Mechanical Sciences, 1973. 662 p.

The application of sensory information and multifunction learning to autonomous manipulator control is studied, as well as computer manipulator control, visual feedback, and related problems. Attention is given to the impacts of teleoperation on modern society, the applications of the remote control of the manipulator in manned space exploration, remotely manned systems for operation and exploration in space, problems in selection of design parameters affecting manipulator performance, and criteria for evaluation of kinematic characteristics of master-slave manipulators. Other papers are devoted to aspects of the control of motion.

F.R.L.

A74-16132 # Man/machine interactions in intelligent robotic systems. G. Weltman and A. Freedy (Perceptronics, Inc., Encino, Calif.). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 15 p. 15 refs.

This paper deals with an experimental study of optimal interaction between human operators and intelligent robots in systems for decision making and control. The study uses an adaptive computer which is able to observe a control task, learn the required responses, and assume control responsibility. The initial findings show that the factors of greatest importance include how predictable the intelligent machine is, how many errors it makes initially, how much information the operator receives about machine decisions, and what his feelings are toward the machine. (Author)

A74-16133 # Computer manipulator control, visual feedback and related problems. A. Gill, R. Paul, and V. Scheinman. In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 19 p. 5 refs. ARPA Contract No. SD-183.

Work at the Stanford Artificial Intelligence Project on Manipulation and Visual Feedback is described, and an attempt is made to provide an overview of the combined work of Gill (1972), Paul (1973) and Scheinman (1969). The design of the manipulator is first described, followed by description in detail of the trajectory generation for manipulator motions and the software servo system. The corner finder used by the visual feedback system and the visual feedback tasks are considered.

F.R.L.

A74-16134 * # Impacts of teleoperation on modern society. A. D. Alexander, III (NASA, Ames Research Center, Advanced Concepts and Missions Div., Moffett Field, Calif.). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 15 p.

A 90-day study was made of teleoperators, robotics, and remote systems technology in the United States. The purpose of the study was to survey state-of-the-art technology in this field, determine major user needs in medicine, mining, and oceanography, and suggest initiatives where federal research and development funding would most significantly impact the application of this technology to the alleviation of explicit national social problems. Following a review of the findings of this study commencing with user needs, speculation is made on impending developments in the application of teleoperation to remote emergency medical care and remote mining systems. F.R.L.

A74-16135 * # The applications of the remote control of the manipulation in manned space exploration. S. Deutsche (NASA, Washington, D.C.) and T. B. Malone (Essex Corp., Alexandria, Va.). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 20 p.

The teleoperator system incorporates many of the advantages of manned systems on the one hand, and mechanical systems on the other. Since man is always in the control loop of a teleoperator system, the system is provided the decision making and adaptive intelligence capabilities which are uniquely human. Conversely, since the actual work is performed by the remotely controlled device, the system incorporates the durability, strength, and the expendable nature of a machine. Use of a teleoperator system is generally safer than placing the man at the worksite, and is generally more flexible and adaptable than an automated mechanical system. Potential earth orbital space missions for teleoperator systems, candidate aerospace teleoperator systems, to perform these missions, and the current status of teleoperator technology development within NASA are discussed.

F.R.L.

A74-16136 * # Remotely Manned Systems for operation and exploration in space. E. Heer (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 15 p. 6 refs.

A brief overview is presented of Remotely Manned Systems with emphasis on their use as tools for exploration and operation in space. Remotely Manned Systems missions and functions in space are described and classified in relation to other existing or planned space systems. Problem areas of large-scale man-machine systems are identified based on experience in the Surveyor program, the Mariner 9 Mars orbiter project and the Apollo program. The effects of communication time delay on system performance are investigated using the average velocity of a Martian rover as performance indicator. A substantial performance increase can be achieved by providing certain autonomous capabilities to the remote system.

(Author)

A74-16137 # Problems in selection of design parameters affecting manipulator performance. D. A. Kugath and D. R. Wilt (General Electric Co., Re-Entry and Environmental Systems Div., Philadelphia, Pa.). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 16 p. 7 refs.

The design and development of manipulators pose difficult cost/performance tradeoffs. The published state of knowledge of manipulator performance is not broad or deep enough to provide a ready means for the designer to prescribe design parameters for a new or special purpose manipulator, such as proposed for the NASA Space Shuttle. Data in the areas of kinematics, compliance, and force feedback are summarized and related to manipulator design. An approach useful in evaluating classes of manipulator for given applications and assuming figures of merit is discussed.

F.R.L.

A74-16138 # Criteria for evaluation of kinematic characteristics of master-slave manipulators and a method for the study of their space performance. G. I. Lukishov (Gosudarstvennyi Komitet

po Ispol'zovaniyu Atomnoi Energii, Moscow, USSR) and Iu. V. Miloserdin (Moskovskii Fiziko-Tekhnicheskii Institut, Moscow, USSR). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 11 p. 6 refs.

In their construction the well-known models of master-slave manipulators may be divided into three groups, i.e., articulated tongs, telescopic manipulators, and articulated manipulators. All these manipulators are versatile in operation and have sufficient degrees of freedom to carry out rather complicated work remotely. At present there are a number of manipulators differing from one another in principal and kinematic diagrams and in their geometrical size as well. To evaluate the manipulator kinematic characteristics qualitatively appropriate quantitative data on their space performance are established. F.R.L.

A74-16139 # Master-slave remote-control manipulator. V. P. Dorokhov (Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii, Moscow, USSR). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 10 p. 7 refs.

Analysis of available manipulator operation shows that in most cases high efficiency of master-slave remote manipulators and convenience of work for the operator are possible without proportional power feedback. The only requirement is to provide operating forces low enough not to cause damage to the object and slave arm. For experimental research of this possibility a master-slave electro-mechanical manipulator with limited forces of the slave arm and limited movements of the master arm was developed and tested. The manipulator control systems are slave follow-up systems, a load information system for the slave arm elements, a system of indirect unbalance compensation for the slave arm elements, a precise space orientation system for the slave arm elements, and an instrument feed movement control system. F.R.L.

A74-16140 # New developments in synergic rate control of manipulators. M. Gavrilovic and M. Maric (Institut Mihailo Pupin za Automatizaciju i Telekomunikaciju, Belgrade, Yugoslavia). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 19 p. 13 refs.

The concept of manipulator control depends to a great extent on the application of the control synthesis. In cases when the neuromuscular complex of the human arm cannot be used as a source of control signals, the organization of the control system becomes complex. For such manipulator applications a concept of synergic rate control is proposed. This concept enables a synthesis of such a control system by which the operator can easily produce complex functional movements of the manipulator since he does it with a reduced number of control signals. New achievements in the development of this concept are described. Special attention has been given to the construction of eating movements needed in rehabilitation. F.R.L.

A74-16141 # Robot and manipulator slave from control viewpoint. V. S. Kuleshov and V. N. Shvedov (Akademii Nauk SSSR, Moscow, USSR). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 14 p.

The questions of robot and manipulator slave unit dynamics as control objects are considered. With an allowance for robot and manipulator performance characteristics, it was possible to get the analytic and structural representation of motion transducers from an actuator to an appropriate joint axis. Using a Lagrangian equation of the second kind, equations of robot and manipulator slave unit dynamics as control objects are investigated. Such representation makes it possible to analyze robots and manipulators as multidegree control systems and to formulate design requirements. F.R.L.

A74-16142 # Articulated manipulators and integration of control software. K. Sato, K. Okamoto, H. Inoue, and K. Takase (Electrotechnical Laboratory, Tokyo, Japan). In: Symposium on Theory and Practice of Robots and Manipulators, 1st, Udine, Italy, September 5-8, 1973, Preprints. Udine, Italy, International Centre for Mechanical Sciences, 1973. 14 p.

The hardware of the articulated manipulators, the primitive subroutines, an interactive operating system, and a task-improving supervisor are described. These were all developed at the Electrotechnical Laboratory (ETL), Tokyo. The ETL-arm is a prototype model of an articulated manipulator whose positions are controlled by hydraulic servomechanisms which are powered by magnetic clutches and brakes of continuous torque output. Besides the usual six degrees of freedom, it has an additional freedom of upper arm rotation. This redundant freedom plays an important role in positioning the hand with the desired arm configuration. Its serving is performed by the program that determines the torques of the clutches and brakes. Thus, not only the position but also the velocity and the torque of this arm are easily controlled by the software, so as to carry out advanced manipulations such as assembling parts, handling tools, and driving a nail into a wall. F.R.L.

A74-16151 # Changes in conditioned-reflex responses in rats under the effect of acceleration (Izmenenie uslovnoreflektornoi deiatel'nosti krysa pod vliyaniem uskorenii). S. I. Nudman (Akademii Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 23, Sept.-Oct. 1973, p. 953-957. 28 refs. In Russian.

Observations on the effects of acceleration overloads in the longitudinal (head-pelvis) and transverse (side-to-side) directions on the conditioned reflexes of rats are reviewed. These observations indicate that temporal reflex indices are considerably more affected than spatial orientation indices by the action of both longitudinal and transverse accelerations. M.V.E.

A74-16152 # Two forms of asymmetry in the reactivity of human brain hemispheres (O dvukh formakh asimmetrii reaktivnosti bol'shikh polusharii mozga cheloveka). M. S. Myslobodskii (Akademii Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 23, Sept.-Oct. 1973, p. 979-985. 34 refs. In Russian.

The averaged evoked potentials in the visual areas of both cerebral hemispheres in response to binocular and monocular light stimuli were studied in 23 healthy subjects. The two types of reactivity asymmetry found are described. One was predominant with binocular stimulation, the other with monocular light stimuli. M.V.E.

A74-16153 # Individual differences in eye micromovements during fixation of a point (Individual'nye razlichia mikrovdvizhenii glaz pri fiksatsii tochki). V. A. Filin, S. P. Sidorov, V. F. Ananin, and T. N. Zagorodnikova (Ministry of Medical Industry, All-Union Research Institute of Medical Instruments and Devices; Physical Culture Therapeutic Dispensary, Moscow, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 23, Sept.-Oct. 1973, p. 995-1002. 14 refs. In Russian.

Eye micromovements during fixation of a point were studied in 120 subjects. The results indicate that the average time interval between eye shifts ranged for all subjects from 0.35 to 2.75 sec, and from 0.75 to 1.5 sec for 70% of the subjects tested. For individual subjects, the variation from test to test in the average time interval between eye shifts amounted to 20%. M.V.E.

A74-16154 # Analysis of interhemispheric relationships based on the law of contrasted perception of light (Analiz mezhpolusharnykh vzaimootnoshenii na osnovanii zakona kontrastnogo vospriiatiia sveta). V. L. Bianki and V. A. Kurochkin (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 23, Sept.-Oct. 1973, p. 1017-1025. 9 refs. In Russian.

Study of the evoked potentials in the visual cortex of rats in response to binocular and monocular light stimuli. The results indicate that, in the primary and secondary visual projection zones of the cortex, both before and after section of the corpus callosum, the evoked potential amplitude is a function of the intensity of light stimuli and obeys the equation of the contrast law of light perception. M.V.E.

A74-16155 # Multichannel biotelemetry system for transmitting the bioelectric activity of the brain (Mnogokanal'naia biotelemetricheskaya sistema dlia peredachi bioelektricheskoi aktivnosti golovnogo mozga). V. I. Sergeev and V. I. Gusel'nikov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *Zhurnal Vyshej Nervnoi Deiatel'nosti*, vol. 23, Sept.-Oct. 1973, p. 1088-1092. 6 refs. In Russian.

A74-16262 Life and further life in space (Leben und Weiterleben im Weltraum). A. L. Martin. *DGLR Mitteilungen*, vol. 6, Nov. 1973, p. 3-6. In German.

The text of an interview with a specialist in the field of experimental biology concerning problems of life support in space and the results of laboratory experiments under simulated space conditions is presented. The questions posed concern the ability of various organisms to survive under extremely hostile conditions, the adaptation reactions of organisms under space flight conditions, the possibility of degeneration phenomena occurring during long space flights, the possibility of alteration of genetic material by cosmic radiation, simulation tests of the effects of weightlessness on the developmental physiology of various organisms (ranging from microorganisms to beetles and frogs), and the question of the existence of extraterrestrial life or early stages of life. A.B.K.

A74-16274 # Dualism in molecular bionics (O dualizme v molekuliarnoi bionike). M. A. Khvedelidze (Akademiia Nauk Gruzinskoi SSR, Institut Kibernetiki, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia*, vol. 71, Sept. 1973, p. 717-720. 17 refs. In Russian.

An attempt is made to extend the notion of dualism of a wave-particle onto the relation between energy and information, a concept which is presently recognized as 'a new field of scientific search.' Basic in this attempt are the established theses that a system-to-system information transfer is possible only by transfer and conversion of any type of energy and that there is a physical and functional dependence of the energy of a material point on its wave number. V.Z.

A74-16275 * Analysis and interpretation of arterial sounds using a small clinical computer system. C. Forbes (MIT, Cambridge, Mass.), R. W. Metzinger, S. K. Holford (Charles Sark Draper Laboratory, Cambridge, Mass.), and T. S. Klitzner (Pennsylvania, University, Philadelphia, Pa.). *San Diego Biomedical Symposium, San Diego, Calif., Jan. 31-Feb. 2, 1973, Paper. 14* p. 22 refs. Grant No. NIH-HL-12621; Contract No. NAS9-12289.

A small mobile bed-side computer system is described that is capable of performing phonoangiographic analyses as well as many other common data analysis tasks in a hospital. The clinical application of phonoangiography is found to be greatly facilitated by the computer-provided availability of data acquisition and analysis capabilities. M.V.E.

A74-16276 Perception of displayed information. Edited by L. M. Biberman (Institute for Defense Analyses, Arlington, Va.; Rhode Island, University, Kingston, R.I.). New York, Plenum Press, 1973. 358 p. \$25.

The papers deal with image quality, observer performance, analysis of noise-required contrast and modulation in image-detecting and display systems, recent psychophysical experiments, and the display signal-to-noise ratio concept. Image reproduction by a line

raster process and the aliasing problems in two-dimensional sampled imagery are treated. The text presents a positive approach toward the design and specification of display parameters.

F.R.L.

A74-16277 Image quality. L. M. Biberman (Institute for Defense Analyses, Arlington, Va.; Rhode Island, University, Kingston, R.I.). In: Perception of displayed information. New York, Plenum Press, 1973, p. 11-86. 22 refs.

The image quality of continuous tone images is discussed, followed by a review of the various theoretical and experimental papers put forward concerning the effect on image visibility of one- and two-dimensional rasters on image quality. The concepts and definitions of continuous tone images are outlined, and line-scanned imagery is considered. Attention is given to scale and time. F.R.L.

A74-16278 Image quality and observer performance. H. L. Snyder (Virginia Polytechnic Institute and State University, Blacksburg, Va.). In: Perception of displayed information. New York, Plenum Press, 1973, p. 87-118.

It is shown that the area between the modulation transfer function (MTF) and the AIM curves is a metric that is broadly applicable for general scenes but is not necessarily a good metric for specific objects. The background concepts, equations, and experimental work are described and evaluated for both continuous-tone photography and sampled (TV) imagery. Some cautions are stated about the use of modulation transfer function area (MTFA) without more than casual thought. F.R.L.

A74-16280 Recent psychophysical experiments and the display signal-to-noise ratio concept. F. A. Rosell and R. H. Willson (Westinghouse Electric Corp., Defense and Electronics Systems Div., Baltimore, Md.). In: Perception of displayed information. New York, Plenum Press, 1973, p. 167-232. Contract No. F33615-70-C-1461.

An approach based on a previously presented common foundation (Snyder, Schnitzler) is given, followed by the building of a more specific foundation leading to, and providing the ability to calculate, the probability of visual detection, recognition, or identification of 'real world' scene objects under specified but realistic conditions on electrooptical displays. To increase the generality and applicability of the signal-to-noise ratio concept, the authors conducted a large number of controlled psychophysical experiment using noisy televised images. A number of these experiments are described which apply to the detection, recognition, and identification of scene objects along with their use in predicting sensory system performance. F.R.L.

A74-16282 Biological aspects of circadian rhythms. Edited by J. N. Mills (Manchester, Victoria University, Manchester, England). London and New York, Plenum Press, 1973. 329 p. \$18.

Laboratory techniques and rhythmometry are first considered, followed by a discussion of transmission processes between a biological clock and manifestations. Latitude and the human circadian system is then examined. Attention is given to chronopharmacology and the circadian rhythms of parasites, in insects, and in plants. Biological clocks and bird migration are studied. F.R.L.

A74-16283 * Laboratory techniques and rhythmometry. F. Halberg (Minnesota, University, Minneapolis, Minn.). In: Biological aspects of circadian rhythms. London and New York, Plenum Press, 1973, p. 1-26. 50 refs. Grants No. PHS-5-KO6-GM-13981-10; No. NGR-24-005-006; Contracts No. NAS2-2738; No. F29600-69-C-0011.

Some of the procedures used for the analysis of rhythms are illustrated, notably as these apply to current medical and biological practice. For a quantitative approach to medical and broader

socio-ecologic goals, the chronobiologist gathers numerical objective reference standards for rhythmic biophysical, biochemical, and behavioral variables. These biological reference standards can be derived by specialized computer analyses of largely self-measured (until eventually automatically recorded) time series (autorhythmometry). Objective numerical values for individual and population parameters of reproductive cycles can be obtained concomitantly with characteristics of about-yearly (circannual), about-daily (circadian) and other rhythms. F.R.L.

A74-16284 **Transmission processes between clock and manifestations.** J. N. Mills (Manchester, Victoria University, Manchester, England). In: *Biological aspects of circadian rhythms*. London and New York, Plenum Press, 1973, p. 27-84. 241 refs.

In animals such as man and the rat, in which a large number of different rhythmic manifestations can be observed, these are commonly in phase with one another, or at least show some regular phase relationship. The concept has thus arisen of a 'clock,' usually supposed to reside in the brain, which controls the other rhythms by one or another form of mediation. The study is concerned with intermediation between the clock and the external manifestations, which can be likened to the 'hands' of the clock. Discussion is largely confined to mammals, since understanding, though scanty, is less inadequate here than in other groups of organisms; likewise, only those rhythms are considered which may be supposed to be endogenous, and for whose transmission from the clock there is some evidence. F.R.L.

A74-16285 **Latitude and the human circadian system.** H. W. Simpson and J. G. Bohlen (Minnesota, University, Minneapolis, Minn.). In: *Biological aspects of circadian rhythms*. London and New York, Plenum Press, 1973, p. 85-120. 54 refs. Medical Research Council Grant No. G-970/192/B.

Data of circadian rhythm parameters obtained at different latitudes available up to the end of 1972 indicate that there appears to be an increase in the amplitude of body temperature rhythm with increasing latitude. No detectable change is noted in rhythm parameters when data for low and middle latitudes are compared. At high latitudes, particularly when subjects were living in the open (e.g., in tents), there is abundant evidence of acrophase delays especially at the solstices (using midsleep as reference) and/or of amplitude damping. A South Pole meteorologist on a voluntary schedule was found to have a sleep/awake periodicity desynchronized from 24 hr. The possible chronopathological basis of the 'hysterical' disease 'Pibloctog' is discussed, as well as the finding of a desynchronized circadian rhythm of 22.9 hr in calcium excretion of one Eskimo. F.R.L.

A74-16298 # **A technique for determining the area and volume of the heart (Metodika opredeleniia ploshchadi i ob'ema serdtsa).** Kh. Z. Sadykov. *Akademiia Nauk Kazakhskoi SSR, Vestnik*, vol. 29, Oct. 1973, p. 69, 70. In Russian.

A total of 100 heart X-ray TV pictures from 50 patients and volume measurements on extirpated rat hearts were used to determine the ratio of X-ray heart shadow to heart size and heart cross section. Empirical formulas were obtained for the calculation of heart volume and area from X-ray pictures, using these ratios. The method is proposed as a more accurate alternative to other methods. V.Z.

(SMEAT) Oct. 1973 6 p refs

STAR ENTRIES

N74-11853*# Ohio State Univ., Columbus.

EVALUATION OF A PULSED ULTRASONIC DOPPLER FLOWMETER Final Report, 1 Nov. 1972 - 30 Sep. 1973
Michael K. Wells 30 Sep. 1973 25 p refs
(Grant NGR-36-008-193)

(NASA-CR-136151) Avail: NTIS HC \$3.25 CSCL 06P

The in vivo application of the pulsed ultrasound Doppler velocity meter (PUDVM) for measuring arterial velocity waveforms is reported. In particular, the performance of the PUDVM is compared with a hot film anemometer of proven accuracy.

Author

N74-11854*# National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.

SKYLAB MEDICAL EXPERIMENTS ALTITUDE TEST (SMEAT)

Richard S. Johnston, comp. Oct. 1973 300 p refs Prepared in cooperation with BioTechnology, Inc., Arlington, Va. (Contract NASw-2518)

(NASA-TM-X-58115) Avail: NTIS HC \$17.00 CSCL 06S

The Skylab 56-day environment simulation test provided baseline biomedical data on medical experiments to be included in the Skylab program. Also identified are problems in operating life support systems and medical equipment.

N74-11855* National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.**INTRODUCTION**

Richard S. Johnston *In its* Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 6 p

CSCL 06S

The objective of the Skylab medical experiment altitude test was to provide a nearly full scale simulation of a 56-day Skylab mission for studying physiological changes produced in man by the long term exposure to space conditions. Evaluated in the altitude chamber tests were human cardiovascular/hemodynamic responses, musculoskeletal/metabolic effects, endocrine/electrode factors, and neurophysiological indices. G.G.

N74-11856* National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.**PROGRAM ORGANIZATION**

In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 5 p

CSCL 06S

The Skylab medical experiments altitude test plan is outlined. Described are the scope and objectives of the program, the management system under which it would be conducted, requirements for configuration of the test facility, test control documentation, data processing, and detailed test objectives.

Author

N74-11858* National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.

LOWER BODY NEGATIVE PRESSURE, EXPERIMENT M092

R. L. Johnson, A. E. Nicogossian, M. M. Jackson, G. W. Hoffler, and R. A. Wolthuis *In its* Skylab Med. Expt. Altitude Test

CSCL 06S

Evaluation of orthostatic intolerance has been achieved by the use of lower body negative pressure (LBNP). The LBNP technique, though independent of gravity, simulates its effect by exposing the legs and the lower abdomen to reduced ambient pressures. This LBNP experiment, conducted during the 56-day simulation of the Skylab environment, was designed to supply baseline information on cardiovascular responses to periodic orthostatic stress. Impaired orthostatic tolerance, manifested by the increased heart rate, diminished systolic and pulse pressure, and increased tendency to syncope in the upright position, or during LBNP, was not observed in this experiment. Author

N74-11859* National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.

VECTOR CARDIOGRAM HARDWARE REPORT, EXPERIMENT M093

Newton W. Allebach (Naval Aerospace Med. Inst.), Raphael F. Smith (Vanderbilt Univ.), and John Lintott *In its* Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 3 p

CSCL 06B

The Skylab vectorcardiogram system was thoroughly tested during the 56-day SMEAT program. Except for a few problems which were readily resolved, the equipment functioned very well. Author

N74-11860* National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.**HEMATOLOGY/IMMUNOLOGY (M110 SERIES)**

In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 5 p

CSCL 06E

The hematology/immunology experiments in the Skylab mission study various aspects of the red blood cell, including its metabolism and life span, and blood volume changes under zero gravity conditions to determine the precise mechanism of the transient changes which have been seen on the relatively brief missions of the past. Author

N74-11861* Texas Univ., Austin, Medical Branch.

CYTOGENETIC STUDIES OF THE BLOOD (M111), PART A
Lillian H. Lockhart *In* NASA, Johnson Space Center Skylab Med. Altitude Test (SMEAT) Oct. 1973 3 p refs

CSCL 06E

The cytogenetic study of the crew appears to indicate that Skylab-type environmental conditions have no deleterious effect upon chromosomal material. The findings are, however, less clear-cut than might be desired, due in large measure to confounding of the experimental design by the administration of isotope injections for the purposes of other experiments and to the lack of control subjects. Author

N74-11862* Texas Univ., Austin, Medical Branch.

INVESTIGATION OF MAN'S IMMUNE SYSTEM (M112), PART B

Stephen E. Ritzmann (Shriners Burns Inst.) and William C. Levin *In* NASA, Johnson Space Center Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 6 p refs

CSCL 06E

Fifty-six days of residence in a Skylab-type environment produce essentially no change in the reactivity of the human immune system, as typified by the rate of RNA or DNA synthesis in small lymphocytes. The one point of divergence between the Skylab simulation crew and previous Apollo crews, a marked depression in synthesis rates on the fourteenth day after the chamber study, may be due to some technical difficulty in the experiment. Lymphocyte morphology changes paralleled functional changes. Author

N74-11863* Baylor Univ., Waco, Tex. Coll. of Medicine.
BLOOD VOLUME AND RED CELL LIFE SPAN (M113), PART C
 Philip C. Johnson, Jr. *In* NASA. Johnson Space Center Skylab
 Med. Expt. Altitude Test (SMEAT) Oct. 1973 4 p refs

CSCL 06P

Prechamber, in-chamber, and postchamber blood samples taken from Skylab simulation crewmembers did not indicate significant shortening of the red cell life span during the mission. This does not suggest that the space simulation environment could not be associated with red cell enzyme changes. It does show that any changes in enzymes were not sufficiently great to significantly shorten red cell survival. There was no evidence of bone marrow erythropoietic suppression nor was there any evidence of increased red cell destruction. Author

N74-11864* Missouri Univ., Columbia. School of Medicine.
RED BLOOD CELL METABOLISM (M114), PART D
 Charles E. Mengel *In* NASA. Johnson Space Center Skylab
 Med. Expt. Altitude Test (SMEAT) Oct. 1973 2 p refs

CSCL 06P

Statistically significant differences were found between Skylab simulation crews and controls for glycolytic enzymes. The absence of simultaneous controls for the pre- and postchamber analyses leaves the significance of the findings in the crew during these periods indeterminate. Author

N74-11865* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
SPECIAL HEMATOLOGIC EFFECTS (M115), PART E
 S. L. Kimzey *In* its Skylab Med. Expt. Altitude Test (SMEAT)
 Oct. 1973 12 p refs

CSCL 06P

All routine hematological measurements for the Skylab simulation test were within normal astronaut population limits for the CDR, SPT, and PLT, with one exception: A significant lymphopenia was observed in the PLT during the post test period, possibly the reflection of increased adrenal corticoid secretion. No ultrastructural red cell membrane abnormalities were observed in any of the subjects, nor were any red corpuscle morphological abnormalities noted. Slight elevations in the PLT's red corpuscular potassium were observed in the younger corpuscles after chamber entrance and again upon egress. This probably represents newly released young red cells from hematopoietic tissue. Flame photometric analyses confirm the fact that potassium is indeed higher in the younger cells of all subjects examined. Author

N74-11866* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
MINERAL BALANCE, EXPERIMENT M071
 G. Donald Whedon (NIH), Paul C. Rambaut, and Malcolm C. Smith, Jr. *In* its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 12 p refs

CSCL 06P

Concern for the long term metabolic consequences of weightless flight was the basis for the conception of the Skylab medical experiment to measure mineral balance. Proper interpretation of obtained data that diminished atmospheric pressure has no appreciable effect, or at least no protective effect, on calcium metabolism. The absence of changes in calcium metabolism indicates that a stable baseline observation has been made for Skylab as far as the effects of atmosphere or calcium metabolism are concerned. Author

N74-11867* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
SPECIMEN MASS MEASUREMENT
 William E. Thornton and Jack Ord (USAF Hospital, Clark AFB, Philippines) *In* its Skylab Med. Expt. Altitude Test (SMEAT)
 Oct. 1973 16 p

CSCL 05E

The Skylab specimen mass measurement device was operated throughout the altitude test in close simulation of the 56-day Skylab mission. It performed operational specimen measurements well until it was passed out of the chamber for replacement of the specimen hold-down and was autoclaved prior to return. Fecal measurements were typically made with less than one percent error. Author

N74-11868* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
BONE MINERAL MEASUREMENT, EXPERIMENT M078
 Paul C. Rambaut, John M. Vogel, John Ullmann, Scott Brown, and Fred Kolb, III *In* its Skylab Med. Expt. Altitude Test (SMEAT)
 Oct. 1973 6 p refs Prepared in cooperation with Public Health Serv. Hosp., San Francisco

CSCL 06P

Measurement tests revealed few deviations from baseline bone mineral measurements after 56 days in a Skylab-type environment. No mineral change was observed in the right radius. One individual, however, showed a possible mineral loss in the left os calcis and another gained mineral in the right ulna. The cause of the gain is unclear but may be attributable to the heavy exercise routines engaged in by the crewmember in question. Equipment problems were identified during the experiment and rectified. Author

N74-11869* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
METABOLIC ACTIVITY, EXPERIMENT M171
 E. L. Michel and J. A. Rummel *In* its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 15 p

CSCL 06P

The Skylab metabolic activity experiment determines if man's metabolic effectiveness in doing mechanical work is progressively altered by a simulated Skylab environment, including environmental factors such as slightly increased pCO₂. This test identified several hardware/procedural anomalies. The most important of these were: (1) the metabolic analyzer measured carbon dioxide production and expired water too high; (2) the ergometer load module failed under continuous high workload conditions; (3) a higher than desirable number of erroneous blood pressure measurements were recorded; (4) vital capacity measurements were unreliable; and (5) anticipated crew personal exercise needs to be more structured. Author

N74-11870* National Aeronautics and Space Administration.
 Lyndon B. Johnson Space Center, Houston, Tex.
BIOASSAY OF BODY FLUIDS, EXPERIMENT M073
 Carolyn S. Leach and Paul C. Rambaut *In* its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 14 p refs

CSCL 06P

Body fluids were assayed in this experiment to demonstrate changes which might have occurred during the 56-day chamber study in fluid and electrolyte balance, in regulation of calcium metabolism, in overall physiological and emotional adaptation to the environment, and in regulation of metabolic processes. Author

N74-11871* Baylor Univ., Houston, Tex.
SLEEP-MONITORING, EXPERIMENT M133
 James D. Frost, Jr. and Joseph G. Salamy *In* NASA. Johnson Space Center Skylab Med. Expt. Altitude Test (SMEAT) 21 p refs Prepared in cooperation with Technol., Inc., Houston, Tex.

CSCL 06S

The Skylab sleep-monitoring experiment simulated the timelines and environment expected during a 56-day Skylab mission. Two crewmembers utilized the data acquisition and analysis hardware, and their sleep characteristics were studied in an online fashion during a number of all night recording sessions. Comparison of the results of online automatic analysis with those

of postmission visual data analysis was favorable, confirming the feasibility of obtaining reliable objective information concerning sleep characteristics during the Skylab missions. One crewmember exhibited definite changes in certain sleep characteristics (e.g., increased sleep latency, increased time Awake during first third of night, and decreased total sleep time) during the mission.

Author

N74-11872* Fordham Univ., New York.

TIME AND MOTION, EXPERIMENT M151

Joseph F. Kubis, J. T. Elrod, R. Rusnak, G. H. McBride, J. E. Barnes, and S. C. Saxon. In NASA. Johnson Space Center Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 7 p

CSCL 05E

Astronaut work performance during the preparation and execution of experiments in simulated Skylab tests was analyzed according to time and motion in order to evaluate the efficiency and consistency of performance (adaptation function) for several different types of activity over the course of the mission; to evaluate the procedures to be used by the same experiment in Skylab; to generate characteristic adaptation functions for later comparison with Skylab data; and to examine astronaut performance for any behavioral stress due to the environment. The overall results indicate that the anticipated adaptation function was obtained both for individual and for averaged data.

Author

N74-11873* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

ENVIRONMENTAL NOISE EXPERIMENT (DTO 71-22)

Jerry L. Homick and Millard F. Reschke. In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 8 p refs Prepared in cooperation with Technol., Inc., Houston Tex.

CSCL 06S

Only general conclusions can be reached of the effect of Skylab simulation chamber noise on the crewmen. Two crewmen experienced a small hearing decrement in-chamber, but there was no pattern as to the ear and frequency affected. Temporary hearing threshold shifts were observed in all three crewmen postchamber. These postchamber threshold shifts were perhaps the most significant finding of the study. However, no lasting detrimental effects on the crew's hearing were found.

Author

N74-11874* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CREW MICROBIOLOGY (DTO 71-19)

B. C. Wooley, J. L. McQueen, R. C. Graves, B. J. Mieszkue, and G. R. Taylor. In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 12 p.

CSCL 06M

States of microbial imbalance as a result of human altitude chamber confinement occurred, for the most part, only in those genera and species of bacteria, yeast, and fungi which are classified as transients and are not part of the true indigenous flora of the crewmembers. Inasmuch as no crew illness events occurred and only subtle changes in the indigenous flora were noted, it appears that confinement of 56-days in a Skylab simulated environment does not mediate toward shifts in bacterial populations which have obvious clinical significance.

Author

N74-11875* Texas Univ., Houston. Dental Science Inst. **EFFECTS OF SMEAT ON THE ORAL HEALTH OF CREWMEN (DTO 71-2)**

Lee R. Brown and Merrill G. Wheatcroft. In NASA. Johnson Space Center Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 6 p refs

CSCL 06E

The oral health status of three astronauts was monitored before, during and after a 56-day simulation of the Skylab mission. Laboratory and clinical parameters which are considered to be ultimately related to dental impairments were evaluated. The

most notable changes were observed in increased counts of mycoplasma and *S. mutans*, decreased counts of enteric bacilli, decreased saliva flow rates, increased secretory IgA and salivary lysozyme levels, and increased clinical scores of dental plaque, calculus and inflammation.

Author

N74-11876* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex. **HABITABILITY/CREW QUARTERS, EXPERIMENT M487**

Robert L. Bond. In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 11 p

CSCL 06K

Skylab experiment M487, habitability crew quarters, is designed to provide an operational evaluation of the Skylab habitat by gathering data regarding the manner in which crewmen carry out their daily living and working routines during the missions. The success of the Skylab habitability experiment depends, in large measure, on the adequacy of the data collection instruments and the manner in which they are used.

Author

N74-11877* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

BIOMEDICAL SUPPORT SYSTEMS

R. M. Brockett, J. M. Ferguson, and S. M. Luczkowski. In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 8 p

CSCL 06B

Biomedical support hardware for SMEAT consisted basically of two systems, the inflight medical support system, and the operational bioinstrumentation system. The former is essentially a diagnostic and therapeutic kit; the latter is a belt equipped with sensors worn by the crewman to permit monitoring of his vital signs. Special attention was given during the use and verification of the items in the systems so that changes required in the equipment could be pinpointed and effected prior to the Skylab mission. During the in-chamber testing, evaluations were made of the effectiveness of the proposed microbiology procedures, techniques, equipment, and the stability of media and reagents over the extended period of storage.

Author

N74-11878* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

MEDICAL OPERATIONS: CREW SURGEON'S REPORT

Charles E. Ross. In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 15 p

CSCL 06E

To assure the safety and well being of the Skylab environment simulation crewmembers it was necessary to develop a medical safety plan with emergency procedures. All medical and nonmedical test and operations personnel, except those specifically exempted, were required to meet the medical standards and proficiency levels as established. Implemented programs included health care of the test crew and their families, occupational medical services for chamber operating personnel, clinical laboratory support and hypobaric and other emergency support.

Author

N74-11879* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CREW BACKGROUND, TRAINING, AND ACTIVITIES

In its Skylab Med. Expt. Altitude Test (SMEAT) Oct. 1973 7 p

CSCL 05E

The brief history of the Skylab altitude test crewmen is followed by an outline of their training in conducting medical experiments, emergency medical procedures, communications, and housekeeping practices during prolonged exposure to the Skylab simulation environment.

G.G.

N74-11880* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CREW REPORT

Karol J. Bobko, Robert L. Crippen, and William E. Thornton. *In its Skylab Med. Expt. Altitude Test (SMEAT)* Oct. 1973 46 p

CSCL 05E

A 56-day chamber simulation of Skylab was successfully completed. The atmosphere (5 psi, 70 percent oxygen, 30 percent nitrogen, 5 mm carbon dioxide) and medical features including a 21-day pre- and 18-day post-test medical protocols were closely simulated. No apparent crew health problems were induced by the atmosphere, semiclosed environment, or other test features; and no appreciable crew degradation appeared over this period. The chamber and associated systems performed without major problems.

Author

N74-11881* Scientific Translation Service, Santa Barbara, Calif.

THE RELATIONSHIP BETWEEN GAS EXCHANGE AND VOLUME PER MINUTE IN THE HEART FOR BATHS AT VARIOUS TEMPERATURES

Kl. Gollwitzer-Meier. Washington NASA Nov. 1973 15 p refs. Transl. into ENGLISH from *Balneologie* (Berlin), v. 4, 1973 p 58-63

(Contract NASw-2483)

(NASA-TT-F-15191) Avail: NTIS HC \$3.00 CSCL 06P

The following were measured in cold and warm bath experiments with male and female subjects: gas exchange (O₂ consumption), respiration, volume throughout of heart per unit of time, circulation, metabolism. The findings were interpreted and compared with earlier work.

Author

N74-11882* Kanner (Leo) Associates, Redwood City, Calif. **EFFECT OF PROLONGED HYPOKINESIA ON THE HEART MUSCLE OF RATS**

I. Prokhaska, I. V. Khavkina, and Z. I. Barbashova. Washington NASA Dec. 1973 11 p refs. Transl. into ENGLISH from *Fiziol. Zh. SSSR (USSR)*, v. 59, no. 8, Aug. 1973 p 1237-1241 (Contract NASw-2481).

(NASA-TT-F-15212) Avail: NTIS HC \$3.00 CSCL 06C

The myocardium as a muscle functioning permanently and in conditions of hypokinesia is experimentally studied. Its efficiency and resistance to anoxic stress action and anaerobic energy exchange after 30-40 day hypokinesia are investigated. Experiments were performed on male white rats weighing 220-270 g. The technique is described in detail, and the results are presented in tables and diagrams, summarized as follows: 30-40 day hypokinesia leads to a sharp weight reduction throughout the test animals' entire body, their hearts, and particularly the right ventricle; one-month hypokinesia leads to a weakening of the contractile properties of the myocardium in rats at a reduction of its resistance to acute oxygen deficiency; at the same time, the rate of anaerobic energy exchange is reduced, leading to the suspicion that it can be one of the components determining the new reduced resistance level of the myocardium.

Author

N74-11883* Kanner (Leo) Associates, Redwood City, Calif. **TIME DEPENDENCE OF VISUAL PERCEPTION ON DIMENSIONS OF ALPHABET-NUMBER TEXT**

E. A. Gilmudtinov and Ye. K. Kostyleva. Washington NASA Dec. 1973 6 p refs. Transl. into ENGLISH from *Issled. po Bionike* (USSR), no. 2, 1972 p 85-88

(Contract NASw-2481)

(NASA-TT-F-15219) Avail: NTIS HC \$6.00 CSCL 05E

As the initial stage of research on determination of optimum symbol size, characters, contrast and symbol-background colors in visual information displays, determinations of visual perception time vs. character dimensions are presented. A special viewing device displaying groups of letter and number symbols of various sizes for a period of 5 seconds, designed to eliminate the need for visual adaptation for each trial, was used. Recording of perception time involves pronunciation of the symbol groups and release of the on button. Automatic advance of the symbol

groups and stopwatch reset are provided. Groups of six to eight symbols, devoid of meaning, pronounceable in identical lengths of time and of a size not requiring movement of the eyeball were used as test objects.

Author

N74-11884* National Aeronautics and Space Administration, Washington, D.C.

EFFECTS OF THE ELECTRICAL STIMULATION OF HUMAN MUSCLES DURING THE SIMULATION OF WEIGHTLESSNESS

L. I. Kakurin, B. B. Yegorov, Ye. I. Ilin, and M. A. Cherepakhin. Dec. 1973 11 p refs. Transl. into ENGLISH from paper presented at the 5th Intern. Man in Space Symp., Washington, D. C., Dec. 1973 10 p

(NASA-TT-F-15244) Avail: NTIS HC \$3.00 CSCL 06P

During hypokinesia, in combination with electrical stimulation, tessellation of the ultrastructure of muscular fibers is observed. This relates to the forms and sizes of the mitochondria, density of the christa packing, the appearance of a large number of ribosomes and glycogen. In singular muscle fibers, necrotic sections were observed. It is concluded that electrical stimulation of the human muscles during space flight, together with physical training, provides a prophylactic effect in maintaining muscle tonus and preventing atrophy under the environmental conditions of limited mobility.

G.G.

N74-11885* National Aeronautics and Space Administration, Washington, D.C.

CHARACTERISTICS OF METABOLISM DURING LONG WATER IMMERSION

R. A. Tigranyan. Dec. 1973 12 p refs. Transl. into ENGLISH of paper presented at the 5th Intern. Man in Space Symp., Washington, D.C., Dec. 1973 11 p

(NASA-TT-F-15245) Avail: NTIS HC \$3.00 CSCL 06S

The effect of the organism of a 12-day stay in a water immersion medium (head on the water surface) was studied on 10 subjects. The condition of the metabolic processes in the subjects was judged from the investigation of the parameters of protein and carbohydrate metabolism, acid-base equilibrium, the activity of a number of enzymes and steroid hormones. The venous blood and diurnal urine served as the material for conducting the corresponding biochemical determinations.

Author

N74-11886* National Aeronautics and Space Administration, Washington, D.C.

FUNCTIONAL TESTS IN THE STUDY OF WATER-SALT EXCHANGE AND RENAL FUNCTION IN COSMONAUTS

Yu. V. Natchin, G. I. Kozrevskaya, and A. I. Grigoryev. Dec. 1973 25 p refs. Transl. into ENGLISH from the paper "Funktsionalnyye proby v Issledovanii Vodno-Solevogo obmena i Funktsii Pochek y kosmonavtov". USSR 25 p Presented at the 5th Intern. Man in Space Symp., Washington, D. C., Dec. 1973 (NASA-TT-F-15246) Avail: NTIS HC \$3.25 CSCL 06P

The alteration in the water-salt exchange and renal activities of cosmonauts in prolonged space flight was studied. The factors influencing these functions are considered. Tabulated results are presented and include the following: (1) electrolyte content, and osmotic concentration in blood serum of cosmonauts before flight, and after flight; (2) elimination of fluid, electrolytes, and osmotically active substance before flight, and during first days after flight; and (3) dynamics of change in body weight after flight. It is concluded that space flight causes a decrease in the excretion of water by the kidneys, and a lowered capability to reabsorb sodium. The charges are attributed to a shift in the activity of the osmotic and volume-regulation systems.

F.O.S.

N74-11887* National Aeronautics and Space Administration, Washington, D.C.

CERTAIN OTORHINOLARYNGOLOGICAL PROBLEMS IN MEDICAL SUPPORT OF SPACE FLIGHTS

I. I. Bryanov, E. I. Matsnev, and I. Ya. Yakovleva. Dec. 1973 11 p refs. Transl. into ENGLISH from the paper "Nekotoryye

Otolaringologicheskiye Problemy v Meditsinskom Obeschenii Kosmicheskikh Poletov" USSR 12 p Presented at the 5th Intern. Man in Space Symp., Washington, D. C., Dec. 1973 (NASA-TT-F-15247) Avail: NTIS HC \$3.00 CSCL 06E

Problems in vestibulology, acoustics, and prophylaxis are discussed in relation to space flight. Studies are being directed to pathophysiological mechanisms of observed disorders among space crews. Modification of diagnostic instruments and methods for otorhinolaryngological diseases is also reviewed. J.A.M.

N74-11888* National Aeronautics and Space Administration, Washington, D.C.

CHANGE IN THE FUNCTIONING OF THE VESTIBULAR ANALYSOR IN SPACE FLIGHT

N. N. Gurovskiy, I. I. Bryanov, and A. D. Yegorov Dec. 1973 17 p refs Transl. into ENGLISH of the paper "Izmeneniye Vestibulyarnogo Analizatora v Kosmicheskoy Polete" USSR 18 p Presented at the 5th Intern. Man in Space Symp., Washington, D. C., Dec. 1973 (NASA-TT-F-15248) Avail: NTIS HC \$3.00 CSCL 06P

Vestibular observations are made concerning the performance of space crews. Spatial illusions are discussed, along with vestibular-vegetative disorders. The effects of Coriolis accelerations in a weightless state on astronauts are also considered. J.A.M.

N74-11889* Radiometric Technology, Inc., Wakefield, Mass. **STUDY OF BLOOD FLOW SENSING WITH MICROWAVE RADIOMETRY Final Report**

Ronald A. Porter and Frank J. Wentz, III 5 Oct. 1973 89 p refs

(Contract NAS2-7087)

(NASA-CR-114675) Avail: NTIS HC \$6.50 CSCL 06P

A study and experimental investigation has been performed to determine the feasibility of measuring regional blood flow and volume in man by means of microwave radiometry. An indication was expected of regional blood flow from measurement of surface and subsurface temperatures with a sensitive radiometer. Following theoretical modeling of biological tissue, to determine the optimum operating frequency for adequate sensing depth, a sensitive microwave radiometer was designed for operation at 793 MHz. A temperature sensitivity of 0.06 K rms was realized in this equipment. Measurements performed on phantom tissue models, consisting of beef fat and lean beefsteak showed that the radiometer was capable of sensing temperatures from a depth between 3.8 and 5.1 cm. Radiometric and thermodynamic temperature measurements were also performed on the hind thighs of large dogs. These showed that the radiometer could sense subsurface temperatures from a depth of, at least, 1.3 cm. Delays caused by externally-generated RF interference, coupled with the lack of reliable blood flow measurement equipment, prevented correlation of radiometer readings with regional blood flow. For the same reasons, it was not possible to extend the radiometric observations to human subjects. Author

N74-11890* Scientific Translation Service, Santa Barbara, Calif.

GOLGI APPARATUS AND ORIGIN OF THE SECRETORY GRANULES IN ADENOHYPOPHYSEAL CELLS IN THE CELLS IN THE RAT. AUTORADIOGRAPHIC STUDIES WITH THE ELECTRON MICROSCOPE AFTER INJECTION OF TRITATED LEUCINE

J. Racadot, L. Olivier, E. Porcile, and B. Droz Washington NASA Nov. 1973 13 p refs Transl. into ENGLISH from C.R. Acad. Sc. Paris (France), v. 261, group 12, 11 Oct. 1965 p 2972-2974

(Contract NASw-2483)

(NASA-TT-F-15189) Avail: NTIS HC \$3.00 CSCL 06C

Upon injection of tritiated leucine, the autoradiographic response first appears in the ergastoplasm. Then the first labelled secretory granules are detected in the Golgi apparatus (30 min.). Finally, the labelled secretory granules are dispersed in the cytoplasm, among the preexisting granules (90 minutes). It is

deduced that the secretory granules originate in the Golgi apparatus from the newly formed proteins in the ergastoplasm.

Author

N74-11891* National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

EFFECTS OF DEHYDRATION ON PERFORMANCE IN MAN: ANNOTATED BIBLIOGRAPHY

John E. Greenleaf Dec. 1973 51 p refs

(NASA-TM-X-62308) Avail: NTIS HC \$4.75 CSCL 06S

A compilation of studies on the effect of dehydration on human performance and related physiological mechanisms. The annotations are listed in alphabetical order by first author and cover material through June 1973. Author

N74-11892* Heinrich-Hertz-Institute fuer Schwingungsforschung, Berlin (West Germany). Abteilung Informationsverarbeitung.

AMANDA: AUTOMIZED MEDICAL ANAMNESIS DIALOG ASSISTANT

A. Seyferth, J. Encarnacao, and J. Negrete (Univ. Nacl. Autonoma de Mex.) 1972 298 p refs In GERMAN

(TB-147) Avail: NTIS HC \$17.00

The AMANDA system, which was used to solve a medical problem using computer graphics, is described. The objective of the system is to allow the patient, before being examined by the doctor, to communicate with the computer as to the type and location of his ailment, in dialog mode. These graphic data are then converted by the system into a medical report for the doctor, and can be used as an aid in diagnosis and therapy determination. ESR0

N74-11893* Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e. V., Graftschaft (West Germany). Inst. fuer Aerobiologie.

REACTIVATION OF TABUN INHIBITED ACETYLCHOLINE ESTERASE. REACTIVITY AND AFFINITY OF SOME PYRIDINIUM OXIMES [REAKTIVIERUNG TABUNGEGEHMMTER ACETYLCHOLINESTERASE. REAKTIVITAET UND AFFINITAET EINIGER PYRIDINIUMOXIME]

K. Schoene Bonn Bundeswehramt 1973 33 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Verteidigung

(BMVg-FBWT-73-23) Avail: NTIS HC \$3.75; Bundeswehramt 20 DM

The rate constants for the inhibition of acetylcholinesterase (AChE) by the esters of phosphoric acid and tabun and paraoxon and the aging of the tabun inhibited enzyme were determined. From the concentration-dependence of the rate constants, terms for the reactivity and affinity of paraoxon and tabun towards AChE were calculated. With regard to these parameters, both alkylphosphates show only insignificant differences in their inhibitory potency. The rate constants of reactivation depend on the concentration of the reactivator. In a similar way constants for reactivity and affinity of some pyridinium oximes could be elevated. These data are about one order of magnitude lower than those determined by the reactivation of paraoxon-inhibited AChE. The results are discussed in connection with related experimental data from earlier experiments in vivo.

Author (ESR0)

N74-11894* Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e. V., Graftschaft (West Germany). Inst. fuer Aerobiologie.

BIOLOGICAL EFFECT OF FAST NEUTRONS ON RETICULOCTE NUMBER AND SPLEEN WEIGHT OF MICE AFTER COMPLETE IRRADIATION [BIOLOGISCHE WIRKUNG SCHNELLER NEUTRONEN. RETIKULOZYTENZAHLE UND MILZGEWICHT VON MAEUSEN NACH GANZKOERPERBESTRAHLUNG]

F. J. OTTO Bonn Bundeswehramt 1973 38 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Verteidigung

(BMVg-FBWT-73-24) Avail: NTIS HC \$4.00; Bundeswehramt 20 DM

The neutron induced decrease in reticulocyte number in the peripheral blood of male mice is complete two days after neutron irradiation. At this time even low doses cause a maximal effect. The relative biological effectiveness of neutrons in reducing the reticulocyte count is 2.5 after low doses and 1.2 after high doses. The spleen of irradiated mice shows a marked loss of weight, with the lowest weight values observed the second day after irradiation. The relative effectiveness of neutrons in diminishing the spleen weight is 2.1 at low doses. The results are compared with previous findings on mortality response and leucocyte and lymphocyte decrease in mice after neutron irradiation. Reticulocyte and lymphocyte counts are useful indicators for the detection and evaluation of neutron damage in the sublethal dose range. Author (ESRO)

N74-11895# Stanford Research Inst., Menlo Park, Calif.
THE CAPACITY OF THE SOIL AS A NATURAL SINK FOR CARBON MONOXIDE Final Report

R. B. Ingersoll Dec. 1972 43 p refs
 (Contracts CAPA-4-68(1-71); EPA-68-02-0307)
 (PB-221641/4; SRI-LSU-1380-FR; CRC-APRAC-CAPA-4-68-6)
 Avail: NTIS HC \$3.75 CSCL 06F

Studies were conducted to determine the potential magnitude of the soils of North America to serve as a sink for atmospheric carbon monoxide. In a series of field studies, soils were exposed in situ to experimental atmospheres containing CO. The influence of environmental factors was studied in the laboratory. The objectives were to: (1) determine the potential CO uptake of soils under natural conditions in the major ecological habitats of North America; (2) determine what influence environmental variables exert on the potential CO uptake rates of soils; and (3) estimate the potential of soils of North America to serve as a sink for atmospheric CO. Author (GRA)

N74-11896# AiResearch Mfg. Co., Los Angeles, Calif.
WASH WATER RECOVERY SYSTEM Final Report
 G. Deckman and J. Rousseau, ed. 10 Oct. 1973 105 p
 (Contract NAS9-13026)
 (NASA-CR-134122; Rept-73-9497) Avail: NTIS HC \$7.25 CSCL 06I

The Wash Water Recovery System (WWRS) is intended for use in processing shower bath water onboard a spacecraft. The WWRS utilizes flash evaporation, vapor compression, and pyrolytic reaction to process the wash water to allow recovery of potable water. Wash water flashing and foaming characteristics, are evaluated physical properties, of concentrated wash water are determined, and a long term feasibility study on the system is performed. In addition, a computer analysis of the system and a detail design of a 10 lb/hr vortex-type water vapor compressor were completed. The computer analysis also sized remaining system components on the basis of the new vortex compressor design. Author

N74-11897# Toronto Univ. (Ontario). Inst. for Aerospace Studies.

DYNAMIC PROPERTIES OF BONE AND SOME ENGINEERING CONSIDERATIONS IN THE DESIGN OF INTERNAL ORTHOPAEDIC PROSTHESES

V. Niranjan Jul. 1973 153 p refs
 (UTIAS-190; CN-ISSN-0082-5255) Avail: NTIS HC \$9.75

The behavior of human compact bone under compressive impact is investigated experimentally. A viscoelastic model is presented to give a satisfactory phenomenological description of bone over a wide range of strain rates. Storage fluids were found not to affect appreciably the elastic stiffness of human compact bone but caused a pronounced change of the viscous stiffness. A method of quantifying microscopic damage under impact is suggested and speculations are made on its relevance to spontaneous fractures. Some hypothetical composite materials are considered for possible use in internal orthopaedic prosthetic and fixative devices. Author

N74-11898# Institute for Perception RVO-TNO, Soesterberg (Netherlands).

A TRAINING COURSE FOR AUDITIVE DOPPLER RADAR OPERATORS

C. L. Truijens 1973 23 p refs In DUTCH; ENGLISH summary
 (IZF-1973-11) Avail: NTIS HC \$3.25

The RASURA identification course, belonging to the RASURA equipment, proved to be unsatisfactory in practical use. An analysis was made of the imperfections of this course and it was decided to design a completely new course. A review is given of some of the literature about training for perceptual skills with special attention to whether either knowledge of results (KR) or cuing is the most efficient procedure. In an experiment three groups of eight subjects were trained to identify 18 RASURA signals. One group was trained with a KR procedure, the second with a cuing procedure and the third group was trained with a modified KR procedure in which the signal remained present during four seconds after the presentation of the correct name of the signal. No significant differences between these groups were found. A new course was composed, consisting of 14 lessons and 14 tests. In each of the lessons the first 10 signals are presented according to the cuing procedure and the following ones according to the KR procedure. Author

N74-11899# Chemtrac, Inc., Rosemont, Ill.
PRELIMINARY FLIGHT PROTOTYPE POTABLE WATER BACTERICIDE SYSTEM Final Report

W. J. Jasionowski and E. T. Allen Oct. 1973 154 p refs
 (Contract NAS9-12792)

(NASA-CR-134135) Avail: NTIS HC \$9.75 CSCL 06K
 The development, design, and testing of a preliminary flight prototype potable water bactericide system are described. The system is an assembly of upgraded canisters composed of: (1) A biological filter; (2) an activated charcoal and ion exchange resin canister; (3) a silver chloride canister, (4) a deionizer, (5) a silver bromide canister with a partial bypass, and (6) mock-up instrumentation and circuitry. The system exhibited bactericidal activity against 10 to the 9th power *Pseudomonas aeruginosa* and/or Type IIIa, and reduced *Bacillus subtilis* by up to 5 orders of magnitude in 24 hours at ambient temperatures with a 1 ppm silver ion dose. Four efficacy tests were performed with a AgBr canister dosing anticipated fuel cell water. Tests show that a 0.05 ppm silver ion dose was bactericidal against 3 plus or minus 1 x 10 to the 9th power (5 plus or minus 1 x 10,000/ml *Pseudomonas aeruginosa* and/or Type IIIa in 15 minutes or less. Author

N74-11900# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ULTRA-FLEXIBLE BIOMEDICAL ELECTRODES AND WIRES
 Patent Application

Salvadore A. Rositano, inventor (to NASA) Filed 13 Jul. 1973 19 p
 (NASA-Case-ARC-10268-2; US-Patent-Appl-SN-379048) Avail: NTIS HC \$3.00 CSCL 06B

A flexible, stretchable biomedical electrode and wire connector which is designed for use by physicians, medical technicians and researchers to connect an electric instrument to the body is described. The electrode and wire connector comprise a soft flexible elastomer which has been loaded with a conductive metallic powder to render it conductive. An important variation of the invention includes an insulating layer over the back and face of the electrode, the face insulation having one of more apertures therein which may be filled with conducting jelly for connecting the electrode to a body. NASA

N74-11901# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ULTRA-FLEXIBLE BIOMEDICAL ELECTRODE AND WIRES
 Patent Application

Salvadore A. Rositano, inventor (to NASA) Filed 13 Jul. 1973 19 p
 (NASA-Case-ARC-10268-3; US-Patent-Appl-SN-379018) Avail: NTIS HC \$3.00 CSCL 06B

A flexible, stretchable biomedical electrode and wire connector which is designed for use by physicians, medical technicians

and researchers to connect an electric instrument to the body. The electrode and wire connector comprise a soft flexible elastomer which has been loaded with a conductive metallic powder to render it conductive. An important variation of the invention includes an insulating layer over the back of the electrode which may be continuous with an insulating layer over the back of the electrode which may be continuous with an insulating layer over the connecting wire. The invention provides a soft, flexible conductive electrode for biopotential measurements or stimulation which has a low contact potential and which has an electrical cable which will conform to the body contour during body motion.

NASA

N74-11902# Department of Civil Aviation, Melbourne (Australia).

ARM REACH BOUNDARIES FOR COCKPIT CONTROL OPERATION

Margaret I. Bullock and Margaret A. Steinberg Jun. 1973 98 p refs

(Memo-31) Avail: NTIS HC \$7.00

Because of the fact that light aircraft cockpits were designed when pilots were restrained by a lap belt only, the recent use of firm upper torso restraint has introduced a problem of control accessibility. Therefore, a determination of the functional arm reach boundaries for the Australian male and female pilot populations has been made and certain structural anthropometric measurements have been recorded. The apparatus used, the experimental procedure and the various percentiles of thumb tip arm reach are described in this report. These data should provide information for the design or modification of restraint systems and of cockpits which will allow manipulation of manual controls by all pilots while effectively restrained.

Author

N74-11903*# Southwest Research Inst., San Antonio, Tex. **APPLICATION OF NASA-DEVELOPED TECHNOLOGY TO THE AUTOMATIC CONTROL OF MUNICIPAL SEWAGE TREATMENT PLANTS** Technical Report, 29 Jun. 1972 - 27 Sep. 1973

Lee L. Hiser and William R. Herrera Nov. 1973 33 p refs (Contract NAS1-11726)

(NASA-CR-132340) Avail: NTIS HC \$3.75 CSCL 061

A search was made of NASA developed technology and commercial technology for process control sensors and instrumentation which would be applicable to the operation of municipal sewage treatment plants. Several notable items were found from which process control concepts were formulated that incorporated these items into systems to automatically operate municipal sewage treatment plants. A preliminary design of the most promising concept was developed into a process control scheme for an activated sludge treatment plant. This design included process control mechanisms for maintaining constant food to sludge mass (F/M) ratio, and for such unit processes as primary sedimentation, sludge wastage, and underflow control from the final clarifier.

Author

N74-11904*# Stanford Univ., Calif. School of Engineering. **SYNTHETIC CARBOHYDRATE: AN AID TO NUTRITION IN THE FUTURE** Final Report

Gerald A. Berman, ed. and Kate H. Murashige, ed. Jan. 1973 312 p refs

(Grant NGR-05-020-409)

(NASA-CR-136152) Avail: NTIS HC \$17.75 CSCL 06H

The synthetic production of carbohydrate on a large scale is discussed. Three possible nonagricultural methods of making starch are presented in detail and discussed. The simplest of these, the hydrolysis of cellulose wastes to glucose followed by polymerization to starch, appears a reasonable and economic supplement to agriculture at the present time. The conversion of fossil fuels to starch was found to be not competitive with agriculture at the present time, but tractable enough to allow a reasonable plant design to be made. A reconstruction of the photosynthetic process using isolated enzyme systems proved technically much more difficult than either of the other two processes. Particular difficulties relate to the replacement of

expensive energy carrying compounds, separation of similar materials, and processing of large reactant volumes. Problem areas were pinpointed, and technological progress necessary to permit such a system to become practical is described. Author

N74-11905# Anacapa Sciences, Inc., Santa Barbara, Calif. **THE USE OF WIDE-ANGLE CINEMATIC SIMULATORS IN PILOT TRAINING** Final Report, Jun. 1970 - Jun. 1972

James J. McGrath Mar. 1973 153 p refs

(Contract N61339-70-C-0306)

(AD-766507; AS-TR-102-4; NAVTRAQUIPC-70-C-0306-1)

Avail: NTIS CSCL 05/9

In a previous program a wide-angle (160 deg) motion picture system was developed and 70-mm films were produced to simulate the visual experience of low-altitude flight. This study was conducted to evaluate and define the best application of this device to pilot training. Three training applications--chart interpretation, coastal entry orientation, and en route visual pilotage--were found to satisfy the criteria of being amenable to cinematic training, operationally important, and in need of improvement in the present training system. A training program involving a combination of classroom instruction and simulator practice was developed and described. In addition a separately titled report (NAVTRAQUIPCEN Technical Report 70-C-0306-2), Chart Interpretation in Low Altitude Flight was produced. This volume summarizes the special characteristics of the low-altitude visual scene and the inherent limitations of aeronautical charts as representations of the earth's surface. It is intended to supplement the training received in the proposed cinematic simulator. (Modified author abstract)

GRA

N74-11906# Joint Publications Research Service, Arlington, Va.

DEVICE FOR SEPARATION OF BIO-ELECTRICAL SIGNALS DURING THE EFFECT OF HIGH-FREQUENCY ELECTRIC CURRENTS ON THE ORGANISM

A. M. Rybakov 13 Nov. 1973 10 p refs Transl. into ENGLISH from Med. Tekhn. (Moscow), no. 4, 1973 p 19-23

(JPRS-60514) Avail: NTIS HC \$3.00

A description is requested of a device for the separation of bioelectrical signals during the effect of high frequency electric currents on the organism.

Author

N74-11907# Forschungsinstitut fuer Anthropotechnik, Meckenheim (West Germany).

HUMAN ENGINEERING INVESTIGATIONS ON DRIVING HIGH-SPEED TRACKED VEHICLES [UNTERSUCHUNG ANTHROPOTECHNISCHER PROBLEME BEI DER FUEHRUNG SCHNELLFAHRENDER KETTENFAHRZEUGE]

K. D. Schulz-Helbach, E. Donges, and G. Rothbauer Apr. 1973 188 p refs In GERMAN; ENGLISH summary

(FB-9) Avail: NTIS HC \$11.50; Forschungsinst. fuer Anthropotechnik, Meckenheim, West Ger. 10 DM

Two human engineering investigations on driving in a high speed tracked vehicle are described. One concerns steering characteristics and the other driver aiding by means of a closed-loop television system. The experiments were conducted using a vehicle simulator for road driving which includes a synthetically generated visual simulation. The steering characteristic investigation showed that the step-like changes in steering sensitivity brought about by gear shifting operations within the transmission may lead to dangerous situations in the curve following. These situations can be avoided by using steering characteristics of which the sensitivity is inversely proportional to the vehicle speed. Investigations with the driver television system showed that specially reduced viewing angles associated with an insufficiently large image field, had a detrimental effect on driving behavior. By using an additional collimating optical system to achieve image field magnification. These effects can be significantly overcome.

Author (ESRO)

N74-11908# Forschungsinstitut fuer Anthropotechnik, Meckenheim (West Germany).

AN IMPROVED MEASURING SYSTEM FOR QUANTIFICA-

TION OF SURFACE ELECTROMYOGRAPHY [EIN VERBES- SERTES MESS-SYSTEM ZUR QUANTITATIVEN OBER- FLAECHE-MYOGRAPHIE]

G. Rau Jun. 1973 34 p refs In GERMAN; ENGLISH
summary

(Anthro-Mitt-2/73) Avail: NTIS HC \$3.75; Forschungsinst. fuer
Anthropotech., Meckenheim, West Ger. 6 DM

An electromyography (EMG) amplifier system for surface
electromyography was developed. Two suction cup electrodes
and the electronic input stage form a small and handy device.
A very high input impedance ($> 200 \text{ MOhm}$) is chosen to
suppress influences of the complex skin resistance on the EMG
signal. Different ways of signal processing for quantifying surface
EMG are discussed. A procedure comprising a double wave
rectification and a special averaging filter has been chosen, which
can easily be constructed. Measurements were made concerning
the relationship between the static extension torque at the wrist
and the processed EMG activity obtained at the m. extensor
carpi radialis longus. Even without normalizing the EMG values
to a reference value, the reproducibility of the relationship was
within about 10% or less during a period of 1 week.

Author (ESRO)

N74-11909# Forschungsinstitut fuer Anthropotechnik, Mecken-
heim (West Germany).

DISCUSSION ON THE NATURE OF NORMAL FINGER TREMOR USING MODEL ANALOGIES [EINIGE MODEL- LUEBERLEGUNGEN ZUR NATUR DES NORMALEN FIN- GERTREMORS]

G. Rau Jul. 1973 20 p refs In GERMAN; ENGLISH
summary

(Anthro-Mitt-3/73) Avail: NTIS HC \$3.00; Forschungsinst. fuer
Anthropotech., Meckenheim, West Ger. 6 DM

Forefinger tremor shows an acceleration frequency spectrum
in the frequency range from about 5 Hz to 40 Hz with a sharp
peak at about 20 - 25 Hz. The spectrum of the electromyography
(EMG) pulsations at the corresponding muscle is more extended
with a flat maximum at about 15 Hz. An extra mass (up to
90 g) added to the forefinger caused a shift of the peak in the
acceleration spectrum to lower frequencies, the EMG spectrum
being unchanged. These properties are described adequately by
a model of a mechanical second order linear filter being excited
by a broad band of muscular strength corresponding to the EMG
spectrum. It can be estimated on the basis of the tremor amplitudes
that the related amplitudes of muscle length cause excitations
of the muscle spindles which remain subthreshold. The findings
are in contrast to the hypothesis considering the reflex loop to
be the origin of physiological finger tremor. Author (ESRO)

N74-11910# Rockwell International Corp., Anaheim, Calif.
Electronics Research Div.

CARBON DIOXIDE MONITORING Final Technical Report. 1 Mar. - 14 Jul. 1973

Philips Biernacki and John J. Kalvinskas 14 Aug. 1973 94 p
refs

(Contract N00014-73-C-0205)

(AD-765342; C73-447/501) Avail: NTIS CSCL 06/11

The program was initiated to establish the feasibility of
applying bioluminescent technology for monitoring of carbon
dioxide (CO₂) in life-support systems for divers, swimmers and
underwater habitats. Experiments were performed to obtain
bioluminescent cultures which are sensitive to levels of carbon
dioxide as low as 81 ppm, in an 80% helium and 20% oxygen
(life-support) gas mixture--at hydrostatic pressures up to
1000 psig. Fourteen luminescent cultures were tested under
conditions of varying pressures, gas proportions, sample sizes,
and flow rates. Strong responses to low concentrations of CO₂
were exhibited by five cultures--thereby demonstrating the
feasibility of employing a luminescent detection system in the
environments of interest. The luminescent responses were sensed
by a photomultiplier tube. The photomultiplier output was fed
through a log amplifier to a strip-chart recorder. This detection
system was more than adequate for laboratory measurements;
however, the requirements for a more compact system were
also examined. It appears that--by using a solid-state sensor

and integrated-circuit electronics--a small, low-power, portable
unit can be developed and constructed. This unit would
provide fail-safe monitoring of CO₂ in underwater life-support
systems. Author (GRA)

N74-11911# Air Force Systems Command, Wright-Patterson
AFB, Ohio. Foreign Technology Div.

RELIABILITY AND EFFICIENCY OF THE MAN-CHECK SYSTEM COMPLEX

A. I. Gubinskii 27 Jul. 1973 18 p refs Transl. into ENGLISH
from the monograph "Psikhologiya v Priborostr., Sb. Inzh." USSR,
1967 p 131-139

(AD-764975; FTD-HT-23-693-73) Avail: NTIS CSCL 05/10

In systems where one of the subsystems is man, it is obviously
necessary to consider also his reliability. GRA

N74-11912# Southwest Research Inst., San Antonio, Tex.

EVALUATE AIRBAG RESTRAINTS FOR SUBCOMPACT CAR PASSENGERS. VOLUME 2: FINAL PROGRAM REPORT Final Report, 29 Jun. 1971 - 13 Nov. 1972

J. D. Michie and M. E. Bronstad May 1973 225 p refs

(Contract DOT-HS-024-1-165)

(PB-222203/2; DOT-HS-800832) Avail: NTIS HC \$6.75 CSCL
13L

An experimental program was conducted to gather data on
the performance of two currently available airbag restraint systems
for passengers of subcompact cars. Twenty sled tests and four
full-scale crashes were conducted using various arrangements
of anthropometric dummies. Both the vehicles and the dummies
were instrumented and highspeed movies were taken. Evaluation
of airbag restraint systems was made. GRA

N74-11913# Southwest Research Inst., San Antonio, Tex.

EVALUATE AIRBAG RESTRAINTS FOR SUBCOMPACT CAR DRIVERS. VOLUME 2: FINAL PROGRAM REPORT Final Report, 29 Jun. 1971 - 13 Nov. 1972

J. D. Michie and M. E. Bronstad May 1973 235 p refs

(Contract DOT-HS-024-1-164)

(PB-222318/8; DOT-HS-800834) Avail: NTIS HC \$5.75 CSCL
13L

An experimental program was conducted to gather data on
the performance of two currently available airbag restraint systems
for passengers of subcompact cars. Twenty sled tests and four
full-scale crashes were conducted using various arrangements
of anthropometric dummies. Both the vehicles and the dummies
were instrumented and highspeed movies were taken. Evaluation
of airbag restraint systems was made. GRA

N74-11914# Air Force Human Resources Lab., Brooks AFB,
Tex.

AUTOMATED PILOT PERFORMANCE ASSESSMENT IN THE T-37: A FEASIBILITY STUDY Final Report, May 1968 - Apr. 1971

Patricia A. Knoop and William L. Welde Apr. 1973 458 p
refs

(AF Proj. 6114)

(AS-766446; AFHRL-TR-72-6) Avail: NTIS CSCL 05/9

Research was conducted to develop a capability for quantifica-
tion and assesment of in-flight pilot performance for utilization
in undergraduate pilot training. The feasibility effort was directed
to overcoming disadvantages of the traditional subjective rating
of a pilot trainees performance by the instructor pilot through
the development of an automated, objective performance measure-
ment system that possesses the characteristics of reliability,
validity, and sensitivity. A T-37 B was instrumented to digitally
record 24 flight and engine parameters. Computer software was
developed to reduce, calibrate, and analyze data from lazy 8
and barrel roll maneuvers, and compute performance measures.
(Modified author abstract) GRA

N74-11915# Naval Training Equipment Center, Orlando, Fla.
Training Analysis and Evaluation Group.

TASK ANALYSIS OF PILOT, COPILOT, AND FLIGHT

ENGINEER POSITIONS FOR THE P-3 AIRCRAFT Final Report

Robert F. Browning, John K. Lauber, and Paul G. Scott Jul. 1973 286 p

(AD-766445; TAEG-7) Avail: NTIS CSCL 05/9

The report provides a task analysis of the pilot, copilot, and flight engineer positions in the P-3 aircraft and delineates the method employed in translating task analysis data into an improved training system. It identifies the behavioral activities of the pilot, copilot, and flight engineer during normal, abnormal, and emergency operations. It contains a method for translation of task analytic data into syllabi, lesson guides, and lesson plans. GRA

N74-12342 Joint Publications Research Service, Arlington, Va. EFFECT OF THE TEMPERATURE CONDITIONS IN THE SPRING AND NITROGEN SIDE DRESSING ON THE GROWTH, DEVELOPMENT AND YIELD OF WINTER WHEAT AND RYE

A. I. Korovin and V. M. Mokiyeyskiy *In its* Meteorology and Hydrol., No. 8 (JPRS-60373) 26 Oct. 1973 p 54-60 refs Transl. into ENGLISH from Meteorol. Gidrol. (USSR), no. 8, 1973 p 78-83

Data are presented on the effect of the temperature conditions of the spring period and nitrogen side dressing on the growth, development and yield of winter wheat and rye. Individual conclusions can serve as a recommendation for nitrogen side dressing in the spring in connection with weather conditions. Author

N74-12343 Joint Publications Research Service, Arlington, Va. EVALUATION OF PHYTOCLIMATE OF BARLEY AS A COVER CROP FOR RED CLOVER WITH HIGHLY DEVELOPED AGROTECHNICS

V. F. Panina *In its* Meteorology and Hydrol., No. 8 (JPRS-60373) 26 Oct. 1973 p 61-66 Transl. into ENGLISH from Meteorol. Gidrol. (USSR), no. 8, 1973 p 84-88

Some results from observations of the phytoclimate of barley and the effect of the agrometeorological conditions on the growth and development of red clover covered by the barley are discussed. The basis is presented for recommendations with respect to the agrotechnics of barley as a cover crop for clover. Author

N74-12588 California Univ., Berkeley. ELECTRONIC INSTRUMENTATION FOR BLOOD FLOW MEASUREMENT AND TISSUE ANALYSIS

J. R. Singer *IN WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 6 p refs*

(Grants FR-7006; ASC-IN87P) Copyright.

The important medical problems of blood flow and cancer diagnoses lend themselves to measurements by nuclear magnetic resonance (NMR) methods. The various means of utilizing NMR for blood flow measurements are described. Differences between normal and malignant tissues can also be measured using NMR. Author

N74-12589 Stanford Univ., Calif. Dept. of Electrical Engineering. INTEGRATED CIRCUITS FOR AN IMPLANTABLE BLOOD FLOWMETER

David M. DiPietro (Hewlett-Packard Co., Santa Clara, Calif.) and James D. Meindl *In WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 5 p refs*

(Contract N00014-67-A-0112-0044; Grant GM-17940-02) Copyright.

An implantable telemetry system for measuring instantaneous pulsatile blood flow in the major arteries of animals has been developed. The device provides a new and necessary tool for accurate quantitative measurements in the study of cardiovascular disease. It has been used in studies of heart rejection and renal function to monitor blood velocity in the major arteries of dogs. The key to achieving this flowmeter is a unique family of custom micropower monolithic integrated circuits. As a micro-miniature radio telemetry system, the device can be totally implanted within the body. Author

N74-12590 Stanford Univ., Calif. Electronics Labs.**A ONE-HAND OPTACON**

Roger D. Melen *In WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 3 p refs*

Copyright.

The Optacon is a portable reading aid for the blind. It uses a 24 x 6 custom fabricated monolithic phototransistor array to detect the print and a 24 x 6 array of piezoelectric vibrators to present a tactile image to the fingertip. It is a direct translation device that displays one printed character at a time. Blind users have attained reading rates of 60 words per minute using this machine. Author

N74-12591 California Univ., Berkeley. Dept. of Electrical Engineering and Computer Sciences.**ENGINEERING-TYPE MODELS OF INFECTIOUS DISEASES**

Edwin R. Lewis and Keh-Loe Lee *In WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 9 p refs*

(Grant NSF GK-3845)

Copyright.

The rate-variable approach, which applies the principle of continuity of flow, is introduced and discussed. The development of network models of population dynamics from the rate-variable approach is presented, along with specific, detailed application to the problem of finding optimum control strategies for a very serious endemic disease, snail fever (schistosomiasis). The modeling results suggest that a threshold exists, below which the endemic will gradually die away, and that the timing of control measures can be crucially important in determining their effectiveness. Author

N74-12600 California State Univ., Long Beach.**NEEDS AND TRENDS IN MEDICAL ELECTRONICS 1973: SESSION 13 OVERVIEW**

Morton D. Schwartz *In WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 4 p*

Copyright.

Today's health care industry, changing patterns in health care, and influence of government on health care are discussed. Future needs and trends for public health programs and care are briefly reviewed. J.A.M.

N74-12601 University of Southern Calif., Los Angeles. Biomedical Engineering Inst.**CLINICAL ENGINEERING AND THE MEDICAL INSTRUMENTATION MARKETS**

Malcom G. Ridgway *In WESCON The 1973 WESCON Tech. Papers, Vol. 17 1973 5 p refs*

Copyright.

Through programs, which are being actively promoted by local hospital associations, and thus promise to spread rapidly, hospitals of all types and sizes within a particular geographical area can obtain access to a range of practical engineering services conveniently and economically. These services include equipment maintenance and calibration and staff instruction programs to

ensure that the equipment is used properly and safely. With local professional biomedical engineering assistance, the hospital group establishes its own nonprofit engineering organization and arranges to share among the participating hospitals, the services of both in-house and regional engineering teams. Author

N74-12602* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

MEDICAL ELECTRONICS: A NEED AND A CHALLENGE

John Dimeoff *In WESCON The 1973 WESCON Tech. Papers.* Vol. 17 1973 4 p
Copyright.

Space programs have led to the development of telemetry pills for diagnosis of diseases of the digestive tract, reusable X-ray image storage plates that require no chemical processing, and muscular augmentation systems for the handicapped. These examples, together with countless other examples of technological innovation that can be drawn from research and development programs supported by government funds, offer a potential opportunity to stimulate growth and to control rising costs in medical electronics. Author

N74-12603 Western Electronic Show and Convention, Los Angeles, Calif.

RECENT COMMERCIAL MEDICAL ELECTRONIC DEVELOPMENTS IN CARDIOVASCULAR AND CANCER TREATMENT

Norman A. Austin *In its The 1973 WESCON Tech. Papers.* Vol. 17 1973 5 p
Copyright.

The integrated circuit has made possible a new family of portable battery operated devices for emergency treatment and diagnosis of cardiovascular problems. These include defibrillators that are used to restore normal heart rhythm, radio communications, EKG tape recorders, and heart rhythm audio warning devices. The bouncing ball P-7 phosphor scope display is being replaced by MOS shift register memory refreshed displays. In radiation therapy of cancer, the transition is being made to electron linear accelerators from cobalt 60. Author

N74-12748 British Library Lending Div., Boston Spa (England).

CLAUSTROPHOBIA, PHOTOPHOBIA AND NYCTALOPHOBIA

M. Deribere 3 Sep. 1973 5 p Transl. into ENGLISH from *Trav. Souterrains* (France), v. 10, no. 161, Jan./Mar. 1970 p 37-38

(BLL-OA-Trans-871-(6196.3)) Avail: British Library Lending Div., Boston Spa, Engl.: 1 BLL photocopy coupon

Aspects of claustrophobia, photophobia, and nyctalophobia in relation to the astronaut in his interplanetary capsule are discussed. Phobias are classified as anxiety neuroses originating in the aggression by the environment on the psyche of the individual, also considered as environmental stress. Claustrophobia is the pathological fear of confined places, photophobia the fear of too much light, and nyctalophobia a fear of the night. G.G.

N74-12747 Texas A&M Univ., College Station.
MEASUREMENT AND ANALYSIS OF GLARE RECOVERY
Ph.D. Thesis

Ronald Scott Morris 1973 165 p
Avail: Univ. Microfilms Order No. 73-21685

Glare recovery is defined as the visual phenomenon associated with the return of retinal sensitivity to the pre-glare level after a short duration exposure to intense light. Experimentation with an existing glare recovery testing device and a TV pupillometer

resulted in the development of a new test apparatus which is described in this dissertation. The device utilizes psycho-physical responses by the test subject before and after a glare exposure to measure the relative visual degradation occurring before glare recovery is complete. Comparison of data collected on subjects with slight visual abnormalities and corrected vision to that collected on normal subjects showed marked differences. Most subjects with visual defects maintained a considerably longer period of visual instability during the third phase of recovery and a longer duration initial phase. Dissert. Abstr.

N74-12748# Advisory Group for Aerospace Research and Development, Paris (France).

SPATIAL DISORIENTATION IN FLIGHT: A HANDBOOK FOR AIRCREW

A. J. Benson (RAF Inst. of Aviation Med.) and E. Burchard (German AF Med. Corps.) Sep. 1973 43 p refs
(AGARD-AG-170) Avail: NTIS HC \$4.25

It has been known for many years that aircrews/suffer from false sensations and perceptions of aircraft motion and that these illusions may hazard the safety of the aircraft and its occupants. This handbook considers the various manifestations of spatial disorientation, their causes and consequences for the benefits of aircrews and their medical attendants. Author

N74-12749# McGill Univ., Montreal (Quebec). DRB Aviation Medical Research Unit.

DRB AVIATION MEDICAL RESEARCH UNIT REPORTS, VOLUME 3, 1971 - 1973

G. Melvill Jones, comp. and G. Mandl, comp. Ottawa Def. Res. Board Oct. 1973 264 p refs Sponsored by Def. Res. Board
(DR-220) Avail: NTIS HC \$15.25

The vestibular contribution to orientation in aerospace flight environments is considered with emphasis on neural mechanisms implicated in visual perception. Also studied are sensorimotor aspects of human postural and locomotor control.

N74-12750 McGill Univ., Montreal (Quebec).

FREQUENCY RESPONSE ANALYSIS OF CENTRAL VESTIBULAR UNIT ACTIVITY RESULTING FROM ROTATIONAL STIMULATION OF THE SEMICIRCULAR CANALS

G. Melvill Jones and J. H. Milsum *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 1-24 refs
Repr. from the *J. Physiol.* (London), no. 219, 1971 p 191-215

(AMRU-R.71:4)

The neural response of semicircular canal-dependent units in the vestibular nuclei of cats has been examined over a frequency range of sinusoidal rotation extending from 0.004 to 0.9 Hz. Frequency response analysis indicates that the information contained in the neural signal received by the brain stem was similar to that expected from the mechanical end organ. The relation between neural response and mechanical stimulus was dominated by a single time constant of about 4 sec, such that two response regions can be defined above and below a stimulus frequency of 1/4 rad/sec. Above this frequency the information content of the neural signal tends towards that of angular velocity and below that frequency it tends towards that of angular acceleration. Author

N74-12751 McGill Univ., Montreal (Quebec).

TRANSFER FUNCTION OF LABYRINTHINE VOLLEYS THROUGH THE VESTIBULAR NUCLEI

G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 25-44 refs Repr. from *Progr. Brain Res.* (Netherlands), vol. 37 Presented at Symp. on

Basic Aspects of Central Vestibular Mechanisms, 1972

(AMRU-R.72:1)

Simple analysis of canal hydrodynamics yields a second order linear differential equation which is re-stated as a transfer function. An experimental study of action potential frequencies induced in central vestibular units by rotational stimulation of the canals yields a similar transfer function. It is inferred that the nervous system transfers the canal response signal to the brain stem with generally good fidelity. In particular it is shown that, over a middle range of frequencies, probably corresponding to those encountered in natural life, the informational content of this signal essentially corresponds to that of head angular velocity. Adjustment of canal frequency response according to animal size is apparently brought about by precise, but very small, changes in canal dimension from one species to another. Author

**N74-12752 McGill Univ., Montreal (Quebec).
REFLEX VESTIBULAR CONTROL OF HEAD MOVEMENTS IN MAN**

J. S. Outerbridge and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 45-55 refs Repr. from *Aerosp. Med.*, v. 42, 1971 p 935-940

(AMRU-R.71:5)

Vestibularly driven head movement was examined in seated human subjects exposed to sinusoidal and stepwise changes in rotational velocity about a vertical axis. In the absence of vision nystagmoid head movements occurred, but not in all subjects. Slow phase head velocity showed less phase advance during slow sinusoidal stimulation than corresponding vestibulo-ocular response, and made a substantial contribution to ocular stabilization in the period immediately following a step change in rotational velocity. The practical and theoretical significance of these findings is discussed. Author

**N74-12753 McGill Univ., Montreal (Quebec).
INVESTIGATION OF HABITUATION TO ROTATIONAL STIMULATION WITHIN THE RANGE OF NATURAL MOVEMENT**

A. Gonshor and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 56-57 refs Repr. from the Proc. of the Ann. Sci. Meeting of the Aerospace Med. Assoc., San Francisco, 1969

(AMRU-R.69:4)

It is shown experimentally that repeated exposure to patterns of rotational stimulation within the range of natural experience, without the aid of vision, does not produce systematic changes of response called habituation in humans. Author

**N74-12754 McGill Univ., Montreal (Quebec).
VESTIBULAR HABITUATION INDUCED BY MIRROR-VISION: AN OPTIMIZING PROCESS?**

A. Gonshor and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 60-62 refs Repr. from the Proc. of the Ann. Sci. Meeting of the Aerospace Med. Assoc., Houston, Tex., 1971

(AMRU-R.71:6)

It is shown experimentally that repeated exposure to unnatural patterns of movement such as prolonged unidirectional rotational stimulation is associated with systematic changes of visual response often called habituation. It is concluded that habituation is induced not by maintained vestibular stimulation per se, but by making that stimulation actively oppose the eye movement required for retinal image stabilization. It seems that habituation is not merely long term adaptation to any maintained sensory stimulus but rather a manifestation of a general tendency in the CNS to meet new optimization criteria when the need arises. Author

N74-12755 McGill Univ., Montreal (Quebec).

EXTREME VESTIBULAR HABITUATION TO LONG TERM REVERSAL OF VISION DURING NATURAL HEAD MOVEMENTS

G. Melvill Jones and A. Gonshor *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 63-65 refs Repr. from the Proc. of the Ann. Sci. Meeting of the Aerospace Med. Assoc., Bal Harbour, 1972

(AMRU-R.72:2)

Human vestibular ocular reflex gain during long term mirror reversed vision in prolonged sinusoidal rotation showed a rapid reduction during the first two days of experiments. After 4 days the gain became negative. In a 28 day experiment this reversal became progressively more marked, reaching a gain of minus 0.3 by the 28th day, compared with the normal pre-experimental gain of plus 0.6. It is concluded that habituation represents the functional reorganization of central neural networks to meet optimization criteria set by new environmental conditions. G.G.

N74-12756 McGill Univ., Montreal (Quebec).

ERRONEOUS PERCEPTION OF VERTICAL MOTION BY HUMANS SEATED IN THE UPRIGHT POSITION

Richard Malcolm and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 66-80 refs Submitted for publication

(AMRU-R.73:1)

The reliability of subjective response to vertical linear accelerations in the absence of vision has been examined in human subjects seated in the upright position. Helicopters and a vertical movement simulator were used to generate sinusoidal vertical movement of period 2-10 sec and acceleration amplitude 0.2 - 0.4 g. Subjective response was recorded as a continually variable assessment of vertical position. Without prior knowledge of the movement pattern, subjects were aware of movement but registered its form with a performance little better than chance. Light to moderate simulated turbulence did not significantly alter performance. Detailed consideration of end-organ orientation in the skull suggests the possibility that relative paucity of vestibular afferent information about vertical movement may account at least in part for the poor tracking performance observed in these experiments. Author

N74-12757 McGill Univ., Montreal (Quebec).

NYSTAGMOGRAPHY: A USEFUL TOOL IN BASIC AND APPLIED INVESTIGATIONS

G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 81-99 refs Repr. from AGARD-CPP-128

(AMRU-R.73:2; AGARD-CPP-128)

There are many recognized patterns of eye movement ranging from very small high frequency oscillations, to large changes in gaze direction. Relatively gross eye movements are considered in quick saccadic, gaze shifts from one fixation point to another, and in relatively slow smooth pursuit movements associated with following a fixation point which is moving relative to the head. In many circumstances these two types of movement are integrated to produce a combined pattern of eye movement suitable for intermittent fixation on a visual field which is moving relative to the head. This integrated pattern of smooth pursuit movements, interspersed with quick repositioning saccades, is defined here as Nystagmus. Methods of recording nystagmus and its data reduction are discussed, together with their applicability and hazards, in relation to intended objectives. Author

N74-12758 McGill Univ., Montreal (Quebec).

THE COLOUR SPECIFICITY OF SPATIAL ADAPTATION: RED-BLUE INTERACTIONS

C. R. Sharpe *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 100-123 refs Submitted for publication
(AMRU-R.73:6)

Results obtained from human psychophysical experiments have shown that spatially adapting to a sinusoidal grating of one color can significantly elevate the contrast threshold of another test grating of a different color. It is proposed that this cross color spatial adaptation is the aftereffect of prolonged inhibition between spatial pattern detectors. Cross color spatial adaptation is found to be interocularly transferred to a significantly greater extent than same color adaptation, suggesting that the former occurs at a more central stage in the visual pathway. Both same color and cross color spatial adaptation are found to be spatial frequency specific. It is proposed that spatial frequency tuning curves determined by cross color spatial adaptation represent the extent of inhibitory input to the detectors responsible for detecting the test gratings, from those detectors stimulated by the adapting grating. Author

N74-12759 McGill Univ., Montreal (Quebec).

THE EFFECT OF FRONTAL EYE FIELD STIMULATION OF UNIT RESPONSES IN THE SUPERIOR COLLICULUS OF THE CAT

D. Guitton and G. Mandl *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 124-131 refs Submitted for publication
(AMRU-R.73:7)

Effects of excited units in the frontal eye field on visually evoked responses of movement sensitive cells in the superior colliculus of the cat are studied. Results show that units unresponsive to visual stimulation can be influenced at short latency by frontal eye field stimulation; they are located 2-3 mm below the superior colliculus surface. Units that respond to both visual and electrical front field stimulation are generally situated more superficially. The influence of electrical front field stimulation on visual responses depends on the relative timing between the two modes of stimulation. It is concluded that a neural discharge originating in the frontal eye field and arriving at the superior colliculus after an eye movement, cannot operate as a corollary discharge. G.G.

N74-12760 McGill Univ., Montreal (Quebec).

THE INFLUENCE OF VISUAL PATTERN COMBINATIONS ON RESPONSES OF MOVEMENT SENSITIVE CELLS IN THE CAT'S SUPERIOR COLLICULUS

G. Mandl *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 132-166 refs Submitted for publication
(AMRU-R.73:8)

The responses of 41 single neurons in the superior colliculi of 18 cats were recorded with extracellular microelectrodes. Eighteen units were tested for variations in directional selectivity and/or orientation preference, and 25 units for variations in velocity preference, when one moving pattern was substituted for another. Eleven units were tested for variations in excitability when movement of one pattern relative to another was substituted for the movement of a single pattern only. Twenty-five units (61%) showed a change in at least one of their response characteristics when tested with different patterns or pattern combinations. It is suggested that the subjectively perceived velocity of an object moving in the visual field depends to a significant degree on the number, and the configuration, of moving and non-moving objects present. Author

N74-12761 McGill Univ., Montreal (Quebec).

IS THERE A VESTIBULO-SPINAL REFLEX CONTRIBUTION TO RUNNING?

G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 167-172 refs Repr. from Adv. Oto-Rhino-Laryng., v. 20, 1972 p 168-174

(AMRU-R.71:7)

It is inferred that despite relatively low vestibular sensitivity to vertical linear acceleration with head erect, there may well be a significant vestibulo-spinal contribution to the neuromuscular control of human running. Author

N74-12762 McGill Univ., Montreal (Quebec).

OBSERVATIONS ON THE CONTROL OF STEPPING AND HOPPING MOVEMENTS IN MAN

G. Melvill Jones and D. G. D. Watt *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 173-190 refs Repr. from J. Physiol. (London), no. 219, 1971 p 709-729

(AMRU-R.71:7)

The presence of a form of stretch reflex has been confirmed in the gastrocnemius muscle of the human leg. The electromyographic manifestation of this reflex occurred 120 msec following a sharply applied, and maintained, dorsiflexing force to the foot. The e.m.g. activity in the above muscle was monitored during single downward steps of 12.7, 25.4 and 38.1 cm and during repetitive, rhythmic, hopping movements on one foot. It was found that e.m.g. activity associated with steps to the ground began 141 msec before contact with the ground and ended 131 msec after contact, when the e.m.g. usually became temporarily inactive. It is inferred from these results that the muscular deceleration associated with landing was brought about by the release of a pre-programmed pattern of neuromuscular activity which was inaccessible to reflex activity resulting from the mechanical event of landing, rather than by a stretch reflex. Author

N74-12763 McGill Univ., Montreal (Quebec).

MUSCULAR CONTROL OF LANDING FROM UNEXPECTED FALLS IN MAN

G. Melvill Jones and D. G. D. Watt *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 191-199 refs Repr. from J. Physiol. (London), no. 219, 1971 p 729-737

(AMRU-R.71:8)

Subjects were dropped from an electromagnetic suspension at unexpected moments and their gastrocnemius electromyographic (e.m.g.) responses and the forces applied to their feet were recorded throughout. No useful contribution of a stretch reflex response was detected. Indeed, it was shown that a functionally effective reflex resulting from the mechanical event of landing would occur far too late to contribute to the muscular deceleration of the fall. It was also found that a consistent muscular response occurred, commencing 74.2 msec after starting the fall, independent of height. It is suggested that this response in the leg musculature is a reflex originating in the otolith apparatus. In addition, a possible mechanism for the control of repetitive hopping, and perhaps running, movements, involving the above reflex, is suggested. Author

N74-12764 McGill Univ., Montreal (Quebec).

ON THE CONTROL OF POSTURAL MUSCLES DURING SOME NATURAL HUMAN MOVEMENTS

G. Melvill Jones and D. G. D. Watt *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 200-209 refs Repr. from Intern. Congr. Ser. No. 253

(AMRU-R.72:4)

The significance of the functional stretch reflex in the gastrocnemius muscle was investigated during the natural human movements of stepping to the ground and repetitive hopping. It was shown that all electromyographic activity in the gastrocnemius concerned with the control of landing from a single step to the ground was completed before the FSR had a chance to contribute. During repetitive hopping while the landing phase of each hop appeared to be similarly preprogrammed, the take-off

phase was timed in such a way as to make use of the FSR. The possibility of the FSR being a long loop reflex is discussed, and some evidence is given to support this hypothesis. Author

N74-12765 McGill Univ., Montreal (Quebec).

IS THE LATE RESPONSE TO MUSCLE STRETCH IN MAN MEDIATED THROUGH A LONG-LOOP REFLEX PATHWAY?

D. G. D. Watt, Christina W. Y. Chan, and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 210-222 refs

(AMRU-R.73:4)

To demonstrate the presence of a long loop response originating in muscle afferent fibres in human subjects, a form of stretch reflex was compared in biceps and gastrocnemius. By subtracting the monosynaptic response time from the latency of the functional stretch reflex, a measure of the time required for conduction within the central nervous system was determined at each segmental spinal level. It was found that while the central conduction time for biceps was 33 msec, that for gastrocnemius was 74 msec, a highly significant difference. In addition, it was found that the central conduction time for quadriceps fell between that of biceps and gastrocnemius. It is inferred that the later response to muscle stretch is mediated at least in part through a long loop reflex pathway. Author

N74-12766 McGill Univ., Montreal (Quebec).

DO MUSCLE AFFERENTS CONTRIBUTE TO LONG-LOOP REFLEXES IN MAN?

C. W. Y. Chan, G. Melvill Jones, and R. F. H. Catchlove *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 223-231 refs

(AMRU-R.73:5)

Muscular response to stretch has been termed the Functional Stretch Reflex (FSR). Experiments were undertaken to investigate the relative contributions of muscle and other afferents to the FSR. In each of ten subjects, complete anesthesia of the ankle and foot was obtained by intravenous regional anesthesia. The MSR to a sharp tap on the Achilles' tendon and the FSR to a suddenly applied and maintained dorsiflexing force to the sole of the foot were recorded by surface emg from the gastrocnemius before, during and after full recovery from regional anesthesia. The results showed no significant change in mean latency of the MSR; the respective mean latencies of the FSR were indistinguishable from one another, as were their response amplitudes. It is therefore concluded that the observed FSR probably originated predominantly from muscle afferents. In conjunction with other current results, it is inferred that these muscle afferent signals mediate their influence at least in part through long loop central pathways. Author

N74-12767 McGill Univ., Montreal (Quebec).

DYNAMIC CHARACTERISTICS OF SACCADIC EYE MOVEMENTS IN PARKINSON'S DISEASE

G. Melvill Jones and J. David DeJong *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 232-246 refs Repr. from Exp. Neurol., v. 31, 1971 p 17-31

(AMRU-R.71:9)

Detailed characteristics of saccadic eye movements in 14 Parkinsonian patients were compared with those in 12 age matched controls. The subjects were required to follow the sudden, randomly timed, stepwise change in position of a visual fixation point through 25 deg. Eye movements were recorded by d-c electrooculography. The following characteristics of individual saccades were measured: amplitude, duration, maximum velocity, times to accelerate to and decelerate from maximum velocity, duration between successive corrective saccades, latency of response. The results showed that the patients had an abnormal tendency to make small saccades followed by one or more

corrections, but that all the other measured characteristics were essentially normal. It is inferred that in these patients the peripheral oculomotor system examined was functionally normal and the centrally coordinated neural programs controlling the observed movements were normal for the amplitudes of saccades achieved. Author

N74-12768 McGill Univ., Montreal (Quebec).

AKINESIA, HYPOKINESIA AND BRADYKINESIA IN THE OCULOMOTOR SYSTEM OF PATIENTS WITH PARKINSON'S DISEASE

J. David DeJong and G. Melvill Jones *In its* DRB Aviation Med. Res. Unit Rept., Vol. 3, 1971 - 1973 Oct. 1973 p 247-257 refs Repr. from Exp. Neurol., v. 32, 1971 p 58-68

(AMRU-R.71:10)

Detailed characteristics of voluntary saccadic eye movement were measured in 14 Parkinsonian patients and 12 age matched controls by d-c electrooculography. Subjects performed rapid, alternating gaze shifts between two fixed visual targets separated horizontally by 25 deg of arc. On average, the patients took about twice as long as the controls to complete a cycle of the alternating task. Since the dynamic characteristics of the patients' saccadic movements were normal for the amplitude achieved, the fault was not due to a reduced ability to make fast, coordinated, muscle movements. The slowed performance was found to be due to two main factors: an increased target fixation time manifest as delayed initiation of voluntary movement, and increased transit time between targets due to the normal delays of about 200 msec between corrective saccades which were necessitated by an abnormal tendency to undershoot the target. The marked akinesia found in this investigation of voluntary eye movements support the previously drawn conclusion that peripheral neuro-muscular components of the oculomotor system are unimpeded by the disease. Author

N74-12769* Little (Arthur D.), Inc., Cambridge, Mass.

EVALUATION OF POSSIBLE INTERACTION AMONG DRUGS CONTEMPLATED FOR USE DURING MANNED SPACE FLIGHTS Progress Report, Jul. 1972 - Sep. 1973

31 Oct. 1973 127 p refs

(Contract NAS9-12970)

(NASA-CR-134161) Avail: NTIS HC \$8.50 CSCL 060

Possible interactions among drugs contemplated for use during manned spaceflights have been studied in several animal species. The following seven drugs were investigated: nitrofurantoin, chloral hydrate, hexobarbital, phenobarbital, flurazepam, diphenoxylate, and phenazopyridine. Particular combinations included: chloral hydrate, hexobarbital or flurazepam with nitrofurantoin; phenobarbital or flurazepam with phenazopyridine; and diphenoxylate with two doses formulations of nitrofurantoin. Studies were carried out in several species to determine whether induction of liver microsomal enzymes would increase the tendency of phenazopyridine to produce methemoglobin in vivo. Animals were premedicated with phenobarbital, a known inducer of azoreductase, and in a separate experiment with flurazepam, before administration of phenazopyridine. Methemoglobin production was determined in each animal after receiving phenazopyridine. No evidence was found for increased production of methemoglobin in the rat, dog, or rabbit that could be attributed to increased amounts of microsomal enzymes. Author

N74-12770* Georgetown Univ., Washington, D.C. Dept. of Biology.

THE EFFECTS OF STRESS ON THE ENZYMES OF PERIPHERAL LEUKOCYTES Final Report, 1 Jul. 1969 - 30 Jun. 1973

Esther M. Leise and Irving Gray Jul. 1973 4 p refs

(Contract NGR-09-009-024)

(NASA-CR-136221) Avail: NTIS HC \$3.00 CSCL 06S

Previous work showed an early response of rabbit and human leukocyte enzymes to the stress of bacterial infection. Since these represented a mixed population of leukocytes and since polymorphonuclear leukocytes (PMN) increased in these preparations, it was necessary to establish whether the observed increase in lactate dehydrogenase (LDH) and protein was the result of an increase in any one particular cell type or in all cells. The need for the development of a simple reproducible method for the differential separation of peripheral leukocytes for the furtherance of our own studies was apparent. It was also becoming increasingly apparent that morphologically similar cells, such as small lymphocytes (L) and macrophages, were capable of different biological functions. A dextran gradient centrifugation method was developed which has provided an easily reproducible technique for separating L from PMN. During the course of this work, in which over 250 rabbits were examined, the pattern of daily leukocyte protein and enzyme variation became increasingly more apparent. This information could have some impact on future work with leukocyte enzymes, by our group and by other workers. The differences in normal protein and enzyme levels maintained by some individuals, and some inbred strains, were evaluated and reported separately. It has been shown that one type of leukocyte may react more to a given stress than other leukocytes.

Author

N74-12771*# Stanford Univ., Calif. School of Medicine.

SUBCELLULAR LOCALIZATION OF PITUITARY ENZYMES

Final Progress Report

Robert E. Smith Aug. 1970 16 p refs

(Grant NGL-05-020-177)

(NASA-CR-136206) Avail: NTIS HC \$3.00 CSCL 06P

A cytochemical procedure is reported for identifying subcellular sites of enzymes hydrolyzing beta-naphthylamine substrates, and to study the sites of reaction product localization in cells of various tissues. Investigations using the substrate Leu 4-methoxy-8-naphthylamine, a capture with hexonium pararosaniline, and the final chelation of osmium have identified the hydrolyzing enzyme of rat liver cells; this enzyme localized on cell membranes with intense deposition in the areas of the paracanalliculi. The study of cells in the anterior pituitary of the rat showed the deposition of reaction product on cell membrane; and on the membranes of secretion granules contained within the cell. The deposition of reaction product on the cell membrane however showed no increase or decrease with changes in the physiological state of the gland and release of secretion granules from specific cells.

Author

N74-12772# Scientific Translation Service, Santa Barbara, Calif.

THE EFFECTS OF NOISE ON GENERAL IMMUNOLOGICAL REACTIVITY

M. L. Khaymovich [1973] 5 p refs Transl. into ENGLISH from Gig. i Sanit. (USSR), v. 38, no. 2, Feb. 1973 p 96-98 Sponsored by EPA

(HS-98) Avail: NTIS HC \$3.00

The presence among cutting-workers of a large number of persons who react negatively to the injection of serum as well as the increased number in proportion to longer work experience, indicate that noise leads to a reduction general immunological reactivity of the organism and this, in turn, is expressed in a higher sick rate.

Author

N74-12773*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.

PLANETARY QUARANTINE COMPUTER APPLICATIONS

M. Rafenstein 15 Dec. 1973 65 p

(Contract NAS7-100)

(NASA-CR-136220; JPL-TM-33-661) Avail: NTIS HC \$5.25 CSCL 06M

The computer programs are identified pertaining to planetary quarantine activities within the Project Engineering Division, both at the Air Force Eastern Test Range and on site at the Jet Propulsion Laboratory. A brief description of each program and program inputs are given and typical program outputs are shown.

Author

N74-12774# Kanner (Leo) Associates, Redwood City, Calif. EXPERIMENTAL STUDIES CONCERNING THE EFFECTS OF AUTOMOBILE EXHAUST GAS ON LIVING ORGANISMS. CONCERNING THE EFFECTS OF LOW-CONCENTRATION NITROGEN DIOXIDE ON LIVING ORGANISMS

Feb. 1973 29 p Transl. into ENGLISH from Kogai shiryō (Yokohama), Mar. 1970 Sponsored by EPA

(TR-405-73; APTIC-26616) Avail: NTIS HC \$3.50

Animals continuously exposed to nitrogen dioxide at extremely low concentration were studied for its effect on their growth and physical strength, on blood properties, and on lung tissues. Histamine measurements, lung moisture content determinations, and physical strength and body weight observations established harmful effects in the respiratory organs. Lung histamine content with time of exposure, and pronounced increases in lung weight and lung histamine content indicated increased irritation by nitrogen dioxide exposure.

G.G.

N74-12775# Aerospace Corp., El Segundo, Calif.

PRELIMINARY CORNEAL DAMAGE THRESHOLD STUDIES WITH HF-DF CHEMICAL LASERS Technical Report, Feb. - Mar. 1972

Donald J. Spencer and Irving L. Dunskey 15 Jul. 1973 26 p refs

(Contract F04701-73-C-0074)

(AD-766255; TR-0074(4240-10)-4; SAMSO-TR-73-215) Avail: NTIS CSCL 06/18

A series of biomedical experiments using chemical lasers was performed in the Aerodynamics and Propulsion Research Laboratory. The purpose of the tests was to establish safety criteria for Air Force-operated laser systems in the 2.6- to 4-micrometer wavelength range. Threshold damage levels were determined for minimal visual corneal damage to the rhesus monkey eye from radiation emanating from HF and DF chemical lasers operating in both continuous and pulsed modes. These are the first corneal damage threshold data obtained at these wavelengths.

GRA

N74-12776# Medical Coll. of Wisconsin, Milwaukee. Dept. of Environmental Medicine.

EXPERIMENTAL HUMAN EXPOSURE TO PROPYLENE GLYCOL DINITRATE Final Report

Richard D. Stewart, Jack E. Peterson, Carl L. Hake, Michael J. Hosko, Paul E. Newton, Andre J. Lebrun, and Hugh C. Dodd Sep. 1973 50 p refs

(Contract N00014-71-A-0424-0001)

(AD-766977) Avail: NTIS CSCL 06/20

Human volunteers were exposed to PGDN vapor at concentrations of 0.03, 0.1, 0.2, 0.35, 0.5, and 1.5 ppm. Exposure to concentrations of 0.2 and greater produced disruption of the organization of the visual evoked response (VER) and headache in the majority of subjects. Subjects repeatedly exposed to 0.2 ppm for 8 hours on a daily basis developed a tolerance to headache induction, but the alteration in VER morphology appeared cumulative. Marked impairment in balance became manifest after exposure to 0.5 ppm for 6 1/2 hours while 40 minutes of exposure to 1.5 ppm added eye irritation to the list of symptoms.

Author (GRA)

N74-12777# Ocean Systems, Inc., Tarrytown, N.Y.

NEUROPHYSIOLOGICAL INVESTIGATION OF INERT GAS EFFECTS ON THE CENTRAL NERVOUS SYSTEM Final

Report, 1 May 1969 - 28 Feb. 1973

Theodore D. Langley 25 Apr. 1973 16 p refs
(Contract N00014-69-C-0405; NR Proj. 101-775)
(AD-766298) Avail: NTIS CSCL 06/19

The program had as its general objective the neurophysiological assessment of the stresses of the gaseous environment encountered in diving. Prominent factors were felt to be those due to ultrahigh pressures, especially following rapid compression, and inert gas narcosis. Major accomplishments were the detailed delineation of the slight narcotic properties of neon at partial pressures as great as 20 atmospheres, both in saturation and following rapid compression, and the exploration of a new technique (somatic evoked responses) for studying such phenomena. GRA

N74-12778* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DIGITAL COMPUTING CARDIOTACHOMETER Patent
Hubert E. Smith, John R. Rasquin, and Roy A. Taylor, inventors (to NASA) Issued 20 Nov. 1973 7 p Filed 7 Apr. 1972
supersedes N72-22098 (10 - 13, p 1702)
(NASA-Case-MFS-20284-1; US-Patent-3,773,038;
US-Patent-Appl-SN-242027; US-Patent-Class-128-2.06F;
US-Patent-Class-128-2.05T; US-Patent-Class-324-78D;
US-Patent-Class-324-186) Avail: US Patent Office CSCL 06B

A tachometer is described which instantaneously measures heart rate. During the two intervals between three succeeding heart beats, the electronic system: (1) measures the interval by counting cycles from a fixed frequency source occurring between the two beats; and (2) computes heart rate during the interval between the next two beats by counting the number of times that the interval count must be counted to zero in order to equal a total count of sixty times (to convert to beats per minute) the frequency of the fixed frequency source.

Official Gazette of the U.S. Patent Office

N74-12779* McDonnell-Douglas Corp., Huntington Beach, Calif.

POTABLE WATER DISPENSER Patent
Herbert R. Cunningham, inventor (to NASA) Issued 11 Dec. 1973 8 p Filed 28 Jun. 1972 Supersedes N72-28097 (10 - 19, p 2517) Sponsored by NASA
(NASA-Case-MFS-21115-1; US-Patent-3,777,942;
US-Patent-Appl-SN-266930; US-Patent-Class-222-309;
US-Patent-Class-222-340; US-Patent-Class-222-387;
US-Patent-Class-222-514) Avail: US Patent Office CSCL 06K

A dispenser particularly suited for use in dispensing potable water into food and beverage reconstitution bags is described. The dispenser is characterized by an expansible chamber, selectively adjustable stop means for varying the maximum dimensions, a rotary valve, and a linear valve coupled in a cooperating relation for delivering potable water to and from the chamber. Official Gazette of the U.S. Patent Office

N74-12780 Arizona State Univ., Tempe.

A MULTIVARIATE STATISTICAL MODEL TO PREDETERMINE PREFERABLE AIRCRAFT ASSIGNMENTS: A FEASIBILITY STUDY Ph.D. Thesis
James Alfred Cline 1973 448 p
Avail: Univ. Microfilm Order No. 73-20434

Research was conducted to investigate the feasibility of constructing a model that could be used by the United States Air Force for the early selection of student pilots for assignment to operational aircraft. Such a model would be of value to the Air Force if the current philosophy of generalized Undergraduate Pilot Training were changed to a specialized philosophy. The results of the study indicate that it is feasible to construct a selection model for application at the completion of the Primary Phase of Undergraduate Pilot Training, to assign pilots to operational aircraft. The validity of the Air Force Officer

Qualification Test as a selection device was questioned. AID is compared to regression analysis as a statistical tool; and, the use of Combat Crew Training grades, and Officer Effectiveness Report ratings as criteria measures are also discussed.

Dissert. Abstr.

N74-12781* Michigan Univ., Ann Arbor. Research Center for Group Dynamics.

A PROGRAM TO REDUCE CORONARY HEART DISEASE RISK BY ALTERING JOB STRESSES Final Report, 1 Aug. 1971 - 30 Sep. 1973 - Ph.D. Thesis
Douglas Bruce Campbell Sep. 1973 274 p refs
(Grant NGR-23-005-185)
(NASA-CR-132891) Avail: NTIS HC \$13.25

This study reports the design, implementation, and evaluation of a program attempting to reduce job stress by improving person-environment fit with respect to job aspects such as work load, responsibility, and interpersonal relationships. In order to assess the effects of the program, measures of both stress and strain were collected at three points in time--just prior to the program, immediately after the program, and three months after completion of the program. Measures of strain included systolic and diastolic blood pressure, determinations of glucose, cholesterol, and uric acid in the plasma, job satisfaction, and job related self-esteem. The findings were interpreted in light of both program incidents within specific experimental groups and general aspects of the program common to the experimental groups. Additional analyses indicated that both good person-environment fit with respect to participation predicts to good fit with respect to other job aspects over a three month interval and that stress causes strain, rather than the reverse. Author

N74-12782* Southwest Research Inst., San Antonio, Tex.

PATIENT ASSIST DEVICE PARTS LIST
Melvin A. Schrader and Menan C. Hanz 29 Oct. 1973 15 p
(Contract NAS9-13582; SWRI Proj. 13-3702-001)
(NASA-CR-134158) Avail: NTIS HC \$3.00 CSCL 06L

A complete parts list for the patient assist device is presented along with the schematic diagrams. F.O.S.

N74-12783* Southwest Research Inst., San Antonio, Tex.

OPERATIONS MANUAL FOR THE PATIENT ASSIST DEVICE
Melvin A. Schrader 31 Oct. 1973 74 p Original contains color illustrations
(Contract NAS9-13582)
(NASA-CR-134160) Avail: NTIS HC \$5.75 CSCL 06L

Quadraplegic patients and multiple amputee patients are almost totally dependent on nursing personnel for any activities or interests in which they participate. A patient assist device is reported which provides patient control over electrical devices in his environment. The patient operates three switches to acquire control over a desired electrical appliance. The type switches employed are chosen to conform to patient capabilities, even when such capabilities are as limited as eye or head movements. The switch operations are sensed and converted into command signals by the patient assist device to control ten electrical appliances simultaneously and independently. Author

N74-12784* Webb Associates, Yellow Springs, Ohio.

THE DEVELOPMENT OF AN ELASTIC REVERSE GRADIENT GARMENT TO BE USED AS A COUNTERMEASURE FOR CARDIOVASCULAR DECONDITIONING
James F. Annis and Paul Webb 14 Dec. 1973 69 p refs
(Contract NAS2-7156)
(NASA-CR-114685) Avail: NTIS HC \$5.50 CSCL 06B

Using a new Nomex-Lycra elastic fabric and individualized garment engineering techniques, reverse gradient garments (RGG's) were designed, constructed, and tested for effectiveness

as a countermeasure against cardiovascular deconditioning. By combining torso-compensated positive pressure breathing with a distally diminishing gradient of counterpressure supplied by the elastic fabric on the limbs, the RGG acts to pool blood in the extremities of recumbent persons much as though they were standing erect in 1 g. It was theorized that through the use of a dynamic pressurization scheme, the RGG would stress the vasculature in a fashion similar to that experienced by the normally active man, hence preventing or limiting the development of post-weightlessness orthostatic intolerance and related conditions. Four male, college-age subjects received daily treatments with the RGG during a 15-day bedrest study. Four additional subjects also underwent the bedrest, but received no treatments; they served as controls. The design and construction of the garments are described, and results of the treatment related measurements are given. Author

N74-12785* Kansas State Univ., Manhattan. Inst. for Systems Design and Optimization.

OPTIMIZATION OF LIFE SUPPORT SYSTEMS AND THEIR SYSTEMS RELIABILITY Final Report, 1 Jun. 1968 - 31 May 1971

L. T. Fan, C. L. Hwang, and L. E. Erickson 15 Aug. 1971 322 p refs
(Grant NGR-17-001-034)

(NASA-CR-136276) Avail: NTIS HC \$18.25 CSDL 06K

The identification, analysis, and optimization of life support systems and subsystems have been investigated. For each system or subsystem that has been considered, the procedure involves the establishment of a set of system equations (or mathematical model) based on theory and experimental evidences; the analysis and simulation of the model; the optimization of the operation, control, and reliability; analysis of sensitivity of the system based on the model; and, if possible, experimental verification of the theoretical and computational results. Research activities include: (1) modeling of air flow in a confined space; (2) review of several different gas-liquid contactors utilizing centrifugal force; (3) review of carbon dioxide reduction contactors in space vehicles and other enclosed structures; (4) application of modern optimal control theory to environmental control of confined spaces; (5) optimal control of class of nonlinear diffusional distributed parameter systems; (6) optimization of system reliability of life support systems and sub-systems; (7) modeling, simulation and optimal control of the human thermal system; and (8) analysis and optimization of the water-vapor electrolysis cell. Author

N74-12786* Massachusetts Inst. of Tech., Cambridge. Measurement Systems Lab.

IDENTIFYING AND DETERMINING SKILL DEGRADATIONS OF PRIVATE AND COMMERCIAL PILOTS Final Report, 20 Apr. 1972 - 5 Jul. 1973

Walter M. Hollister, Arthur LaPointe, Charles M. Oman, and John R. Tole Sep. 1973 74 p refs
(Contract DOT-FA72WA-2767)

(FAA-RD-73-91; RE-85) Avail: NTIS HC \$5.75

The aeronautical skills of pilots were studied to determine the effects of experience factors. A sample of 55 pilots each flew three flights with an evaluator in a Cessna 150. On the average, subjects received higher scores on skills employed most often. They received the lowest average scores on skills seldom practiced such as stalls and simulated instrument flight. A step-wise regression analysis indicated that an individual's latent skill accounts for 30% of the variance between pilots. Experience factors accounted for 25% of the variance. The most predictive of these experience factors were recency and the logarithm of total time. Recency is the average rate at which a pilot flies. It is the most important experience factor and the one which the pilot can vary most easily. The logarithm of the total time was the second most important experience factor. The logarithmic dependence causes changes of total time to be more important for pilots with low total time. Skill degradation with years since certification was the third most important experience factor. Author

N74-12787* Scientific Translation Service, Santa Barbara, Calif.

CHANGES IN SEVERAL PHYSIOLOGICAL INDICES UNDER THE INFLUENCE OF METAL WORK IN STUDENTS

S. M. Rashman [1973] 5 p refs Transl. into ENGLISH from Gigiena i Sanit. (Moscow), v. 38, no. 2, Feb. 1973 p 105-106
Sponsored by EPA

(HS-100) Avail: NTIS HC \$3.00

The dynamics of oxygen saturation of arterial blood as well as changes in the circulation rate and arterial pressure were studied under the influence of mental work. The dynamics of oxygen saturation of arterial blood were determined by the oxyhemography method, using an O-36 oxyhemograph. Circulation rate was studied by the bloodless oxyhemography method in the lung-ear segment. Arterial pressure was measured by mercury manometer. Results show that the dynamics of oxygen saturation of arterial blood during mental activity can serve as one criterion of its intensity and complexity. As regards changes in circulation rate and arterial pressure, in combination with changes in a number of other indices they can, to a certain degree, indirectly reflect the mobilization readiness of the cardiovascular system in one or another form of mental work. Author

N74-12788* Research Inst. of National Defence, Stockholm (Sweden).

RAPID INFLATION OF A FABRIC BAG BY SOLID FUEL GASES [SNABBUPPBLASNING AV TYGPASE MED KRUTGAS]

David Jacobsson and Sixten Thoren Mar. 1972 18 p ref In SWEDISH

(FOA-1-C-1446-F1) Avail: NTIS HC \$3.00

Experiments have been carried out with a solid fuel gas generator for rapid inflation of a fabric bag intended as a protective shield in an automobile. The tests were made with a bag of 60 litre capacity. With the gas generator supplied, the filling time was approximately 75 ms. This time was hardly changed when the amount of fuel varied from 30 to 60 g. At 40 g fuel, a maximum additional pressure of 0.11 to 0.26 atm was reached after about 160 ms. A pressure of 0.5 atm would probably require 60 g. The maximum temperature varies considerably with the position of the measuring point but the representative value would be between 100 and 200 C after 150 ms after which the temperature falls to about 50 C in a few seconds. The maximum noise pressure was, on average, 145 db and the highest 152 db. The bag burst in several cases during the latter series of tests although it remained intact during the earlier series. The reasons for this are not known, but the temperature of the solid fuel gas and its composition can be assumed to be the causes of the problem. Author

N74-12789* Research Inst. of National Defence, Stockholm (Sweden).

METHODS AND TECHNOLOGY FOR STUDIES ON DAZZLING WITH THE HELP OF OPTO-KINETIC-NYSTAGMUS (OKN) [METOD OCH TEKNIK FOER STUDIER AV BLAENDNING MED HJAELP AV OPTO-KINETISK-NYSTAGMUS (OKN)]

Brian Hoegman Jan. 1972 32 p In SWEDISH

(FOA-2-C-2517-E1/E3/E4/H5) Avail: NTIS HC \$3.75

Eye performance under different forms of dazzle was studied by an apparatus that records eye opto-kinetic nystagmus by means of electro-oculography. An account is also given of different methods for dealing with recorded data. The apparatus proved to be particularly suitable for the tests, especially because its construction allows for wide variations in illuminating parameters which are significant in judging eye performance with dazzle at different levels. Author

N74-12790* Research Inst. of National Defence, Stockholm (Sweden).

THE FUTURE OF COLOURED ILLUSTRATIONS [FARGBIL-

DEN I FRAMTIDEN]

Gunnar Tonnquist Jan. 1972 18 p In SWEDISH
(FOA-2-C-2521-E1/E3/E4) Avail: NTIS HC \$3.00

A popular scientific survey is given over the possible lines of development for the recording and reproduction of color pictures. A description is also given of how color and color pictures can be used not only for decoration and nonessentials, but also to improve presentation of information in scientific, technical, and physical communication and not least as a safety factor. Author

N74-12791# Research Inst. of National Defence, Stockholm (Sweden).

THE DEPENDENCE OF THE OPTICAL BLINK REFLEX ON LIGHT ENERGY [OPTISK BLINKREFLEX BEROENDE AV LJUSENERGI]

Brian Hoegman, Bjorn Tengroth, and Goran Ornberg Jan. 1972 42 p refs In SWEDISH

(FOA-2-C-2519-E1/E3/E4/H5) Avail: NTIS HC \$4.25

Light energy influences on the optical blink reflex are described from an experiment where the triggering light duration and luminance were varied. For the experiment two different age categories of test personnel were used. The results show that no major differences concerning reaction time could be established at the levels of energy used in the experiment. On the other hand, reaction is affected by movement of the eye lids and frequency of covering the pupil etc. Moreover, differences in reaction dependence on the age of the test personnel can be established. Author

N74-12792# Research Inst. of National Defence, Stockholm (Sweden).

ALTERNATIVE METHODS FOR RECORDING BLINK REFLEX [ALTERNATIVA METODER FOR REGISTRERING AV BLINKREFLEX]

Brian Hogman, Bjorn Tengroth, and Goran Ornberg Jan. 1972 39 p refs In SWEDISH

(FOA-2-C-2518-E1/E3/E4/H5) Avail: NTIS HC \$4.00

The optical blink reflex is studied with two different recording methods, each with two evaluation alternatives. The blink reflex has been recorded partly with high speed photography and partly by means of electro-oculography. The reflexes were recorded simultaneously. A comparison is given of the different evaluation alternatives their accuracy and the work involved. Author

N74-12793# Research Inst. of National Defence, Stockholm (Sweden).

COMPUTER PROGRAM FOR MEASURING BLINK REFLEX. PART 1: MOVEMENT OF THE EYELIDS [DATAPROGRAM FOR BERAKNING AV BLINKREFLEX. DEL 1: OGOLOCKETS RORELSE]

Hjordis Celander Oct. 1971 39 p refs In SWEDISH
(FOA-2-C-2495-E1/A4-Pt-1) Avail: NTIS HC \$4.00

A film has been taken of an eye blinking when caught in a flash of light. On the photographs so obtained, measurements have been made of the eye lids position by means of a film evaluation apparatus which delivers the results in the form of a punched card, one for each photograph. A description of a computer program is given which registers these data cards and from them calculates and plots curves of the eye lids' displacement as a function of time. A number of reference points measured on the photographs have also been examined from which information has been obtained concerning the accuracy of measurement. Author

N74-12794# Research Inst. of National Defence, Sundbyberg (Sweden).

RAPID INFLATION OF A FABRIC BAG BY AN INERT GAS [SNABBUPPBLASNING AV TYGPASE MED INERTGAS]

Sixten Thoren Mar. 1972 28 p refs In SWEDISH
(FOA-1-C-1445-F1) Avail: NTIS HC \$3.50

The phenomena of time, pressure, temperature and noise that arise when inflating a 60 liter fabric bag with inert gas are investigated. Representative data from the investigation have been collected and are presented in the form of pictures, tables and diagrams. Author

N74-12795# Research Inst. of National Defence, Stockholm (Sweden).

A COMPARISON BETWEEN THE THRESHOLDS OF DETECTION WITH A STATIONARY AND MOVING OBJECT AGAINST BACKGROUNDS OF DIFFERENT COMPLEXITY [EN JAMFORELSE MELLAN UPPTACKTS-TROSKLARN A VID STILLASTAENDE OCH RORLIGA MAL MOT BAKGRUN- DER AV OLIKA KOMPLEXITET]

Agnetta Jonsson Feb. 1972 30 p refs In SWEDISH
(FOA-2-A-2551-H5) Avail: NTIS HC \$3.50

The object was composed of black squares and presented partly stationary and partly at speeds of 2.9 arc min/s and 14.4 arc min/s against three different backgrounds. For experiment 1 the background was a homogeneous white, in experiment 2 it consisted of randomly situated black spots against a white ground, and in experiment 3 it was the same as 2 but with a larger number of spots. The threshold levels were the same for stationary and moving objects in the experiment without background structure. In experiment 2 (slight disturbing structure) and experiment 3 (considerable disturbing structure) the threshold levels were lower for moving than for stationary objects and this difference was greatest in experiment 3. The speed of 14.4 arc min/s gave lower threshold levels than the speed of 2.9 arc min/s. This is thought to be due to the contrast factor being most significant with a white background whilst the movement factor is of little or no significance for the objects threshold level. Author

N74-12796# Research Inst. of National Defence, Stockholm (Sweden).

AN EXPERIMENTAL STUDY OF THE SIGNIFICANCE OF SHARPNESS OF OUTLINE IN VISUAL DETECTION [EN EXPERIMENTELL STUDIE AV KANTSKARPANS BETY- DELSE VID VISUELL DETEKTION]

Lars Linden Dec. 1971 17 p refs In SWEDISH
(FOA-2-C-2507-E1) Avail: NTIS HC \$3.00

The importance of sharp outlines in detecting visual signals from strong additive noise is reported. Experiments indicate that for certain test observers the probability of detecting the signal was strongly dependent on sharp outlines whilst for others it was almost independent of them. The experiments are discussed starting from two models of the visual process. Author

N74-12797# Research Inst. of National Defence, Stockholm (Sweden).

A METHOD FOR A SIZE, POSITION AND ROTATION INVARIANT DESCRIPTION OF A SILHOUETTE [EN METOD FOER STORLEKS-, LAEGES- OCH ROTATIONSINVARIANT BESKRIVNING AV EN SILHUETT]

Bjoern Kruse Feb. 1973 22 p ref In SWEDISH
(FOA-3-C-3701-E5) Avail: NTIS HC \$3.25

Different ways of describing objects entering into a picture are studied in the field of picture treatment. Descriptions of a way of characterizing the object's silhouette by size, position, orientation and shape are given. The indication of shape depends on size, position and orientation interpreted for every silhouette. Author

N74-12798# Battelle Memorial Inst., Richland, Wash.
MEASUREMENT OF RADIATION EXPOSURE OF AS- TRONAUTS BY RADIOCHEMICAL TECHNIQUES Quarterly Research Report, 2 Apr. - 30 Jun. 1973

R. L. Brodzinski 15 Jul. 1973 22 p refs Sponsored in part by NASA
(Contract AT(45-1)-1830)

(NASA-CR-136217; BNWL-1183-15) Avail: NTIS HC \$3.25
CSCL 06R

A cosmic radiation dose to the Apollo 17 crew of <1.3 R was calculated from the specific activities of Na-24 in their postflight urine specimens. The specific activities of K-42, Cr-51, Co-60, and Sb-124, introduced by injection into the astronauts, are extremely high in these specimens. The Fe-59 and Cs-137 levels are also reported and appear to be normal. The concentrations of Na, K, Rb, Cs, Ca, Sr, Ba, Cr, Fe, Co, Ag, Au, Zn, Cd, Hg, Sn, As, Sb, Se, Br, Sc, La, Sm, Eu, Tb, Hf, Ta, and Th were measured in urine specimens from the Apollo 17 astronauts by neutron activation analysis. Strontium, barium, gold, cadmium, lanthanum, samarium, europium, terbium, thorium, and tin are reported for the first time. The concentrations or excretion rates of bromine and the alkali metals exhibit significantly reduced postflight levels and are generally lower than values observed for previous missions. Chromium concentrations reflect radiochromium injections. Author (NSA)

N74-12799# Freiburg Univ. (West Germany). Inst. fuer Physik.

FREQUENCY AND SEQUENTIAL ANALYSIS OF TIME SERIES [FREQUENZ- UND SEQUENZANALYSE VON ZEITREIHEN]

G. Landwehr Nov. 1972 39 p refs In GERMAN
(Rept-C-19) Avail: NTIS HC \$4.00

The possibility of the sequential analysis of time series using a digital computer, is investigated, and compared with frequency analysis. The investigations were based on the application of discrete Fourier and Walsh transformations. A technique is described to obtain comparable Fourier and Walsh spectrograms. The representation of the sine functions with the aid of Walsh functions produces the explanation why Fourier and Walsh spectrograms are similar. Fourier and Walsh spectrograms were prepared and discussed for electroencephalogram signals, the German vowel a, and an 'artificial' time series (a machine program for a digital computer). ESRO

N74-12800# Technische Hochschule, Darmstadt (West Germany). Inst. fuer Flugtechnik.

CONSIDERATIONS OF THE PILOT IN FLIGHT MECHANICAL PROJECT STUDIES [ZUR BERUECKSICHTIGUNG DES PILOTEN BEI FLUGMECHANISCHEN PROJEKTSTUDIEN]

Manfred Zindel 15 Oct. 1972 67 p In GERMAN
(IFD-3/72) Avail: NTIS HC \$5.50

Existing mathematical models for describing pilot behavior are reviewed. Experiments aimed at establishing a new model were carried out, based on the reaction-time-depends-on-input-signal assumption. Two types of input signals, with corner frequencies of 0.7 Hz resp. 0.1 Hz were used. The reaction time of persons tested, who were asked to recognize the input signal variation and to compensate these with the aid of the buttons, was measured. The results showed that the fluctuation value of the reaction time is independent of the local properties of the input signals. Average value and standard deviation of this fluctuation value clearly depend on the flat rate properties of the input signal. ESRO

N74-12801# Air Force Human Resources Lab., Brooks AFB, Tex.

VARIABLES INFLUENCING THE PERCEPTION OF FLICKER IN WIDE ANGLE CRT DISPLAYS Final Report

William L. Welde and Bertram W. Cream Dec. 1972 81 p refs
(AF Proj. 1710)

(AD-766443; AFHRL-TR-72-4) Avail: NTIS CSCL 05/10

An experiment was conducted to determine the influence of several variables on the perception of the psychophysical phenomenon of flicker in wide angle CRT displays. Three independent variables were 3, 6, and 9 FL illumination levels, of which there were four images, three static and one dynamic; 26 fixation points were positioned around a display from 0 to 120 deg in the horizontal axis and 60 deg down to 90 deg up in the vertical axis. Recorded measures in the factorial experiment consisted of time to the first observation of flicker, percentage

of the total number of trials that flicker was observed, and the severity of flicker regarding its interference with a visual task. Analysis of variance tests were applied to the experimental data. (Modified author abstract) GRA

N74-12802# URS Systems Corp., Falls Church, Va. Matrix Research Div.

ASSISTANCE IN IMPROVING THE ELECTRONIC TECHNICIAN TRAINING AT THE US COAST GUARD TRAINING CENTER, GOVERNOR'S ISLAND, NEW YORK Final Report

E. L. Shriver and F. L. Hart Jan. 1973 107 p refs
(Contract DOT-CG-13542-A)

(AD-766556) Avail: NTIS CSCL 05/9

A training module was developed for each of the following equipments: Radar, radio receiver, LORAN receiver, and transmitting set. The student is guided through an analytic process by answering a series of carefully structured questions designed to guide him through a complete analysis of the equipment for both understanding and troubleshooting. Training emphasis is not on theory but on the practical applied aspects of maintenance through the use of technical manuals and hands for the repair of equipment failures. Performance tests were developed for each module. GRA

N74-12803# Indiana Univ., Bloomington. Div. of Optometry. **COMPARATIVE PERFORMANCE OF AVIATION FILTERS ON THE HUMAN CONTRAST SENSITIVITY FUNCTION** Final Report, Mar. 1971 - Jun. 1973

Ronald W. Everson and John R. Levene Jul. 1973 74 p refs
(Contract F33615-71-C-1730; AF Proj. 7183)

(AD-767212; AMRL-TR-73-13) Avail: NTIS CSCL 05/5

Grating targets of different spatial frequency and with square and sine wave luminance distributions were presented to male subjects who wore ophthalmic filters that are frequently used by aviators, namely, neutral gray, yellow, and rose-colored. Threshold light modulation that permitted detection of the grating pattern was determined. Average luminance levels from bright to dim were used. Although contrast sensitivity was found to vary with luminance level, it has not been possible to demonstrate the clear-cut superiority of one colored sunglass filter over another in this experiment. The differences that are seen are related to the luminous transmittances of the filter and not to their intrinsic colorations. Author (GRA)

N74-12804# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.

EXCURSIONS OF HEAD, HELMET AND HELMET-ATTACHED RETICLE UNDER PLUS G FORCES Final Report

Kenneth W. Kennedy and K. H. Eberhard Kroemer May 1973 90 p refs
(AF Proj. 7184)

(AD-767201; AMRL-TR-72-127) Avail: NTIS CSCL 05/5

Open-loop centrifuge runs reaching -6g(z) were performed with 13 subjects wearing two different types of helmets: the foam-padded standard HGU-2A/P, and the Gentex 129-2 with adjustable web suspension. Rigidly attached to the helmet was a lightweight reticle with its crosshair about 1 1/2 inches in front to the left eye. Masses were attached at top and sides of the helmets. The total maximal load was limited to 40 ounces, and the largest lateral off-balance to 15 ounces. During the centrifuge runs, each subject attempted to maintain his gaze at a target directly in front of him. Hence, no voluntary motion of the head should have occurred. Position of head, helmet, and reticle were recorded photographically at each g-level. From the photographs, data on actual excursions of the head, helmet, and reticle were extracted and subjected to a computer-aided analysis. Involuntary angular head movements, as well as rotational displacements of the helmet on the head, are discussed in this paper in terms of pitch, roll and yaw. Also described are linear changes in the vertical height of the subjects' eyes. Reticle displacements are discussed as they occurred in a frontal y-z plane. Author (GRA)

N74-12805# New Mexico State Univ., University Park. Dept. of Psychology.

COLOR RESEARCH FOR VISUAL DISPLAYS Final Report, 1 Feb. 1972 - 31 Jul. 1973

Richard E. Christ and Warren H. Teichner Jul. 1973 118 p refs

(Contract N00014-70-A-0147-0003; NR Proj. 213-102)

(AD-767066; NMSU-JANAIK-FR-73-1; JANAIK-730703) Avail: NTIS CSCL 05/5

The experimental literature on the effects of color on visual search and identification performance was reviewed. Forty-three studies published between 1952 and 1973 were located that gave results which could be used to determine the effectiveness of color codes relative to various types of achromatic codes. Quantitative analyses of these results indicated that color may be a very effective performance factor under some conditions, but that it can be detrimental under others. Tentative conclusions about the nature of these conditions were derived from the results and these conclusions were supported by an exploratory experiment. A guide for design decisions and an indication of knowledge gaps are also provided. Author (GRA)

N74-12806# Naval Aerospace Medical Research Lab., Pensacola, Fla.

ISOLATION RECURRING STUDENT PILOT ERRORS DURING PRIMARY FLIGHT TRAINING. 1: SPIN MANEUVER

Richard H. Shannon, Wayne L. Waag, and Gerald M. Long 15 Aug. 1973 44 p

(MF51524002)

(AD-767377; NAMRL-1189) Avail: NTIS CSCL 05/9

The investigation attempted to: Develop a conceptual model for investigating student naval aviator (SNA) performance in primary flight training; isolate, with the use of the model, those behaviors within the spin maneuver which are judged to be recurring student pilot errors; assess the criticality of these errors as they relate to the grades a student receives; and provide behavioral definitions of the global skills, basic airwork, headwork, and procedures. A procedural type of task analysis was performed on the spin maneuver. The necessary responses to each display and control both within and outside the aircraft were specified on a sequential continuum. Within each of these sequential components, a highly elemental approach (i.e., emphasis on the simultaneous individual responses to each display and control at each point in time) was taken so that it was possible to isolate the required simultaneous response configuration at any given point throughout the maneuver. An objectively structured questionnaire was developed using these individual task elements as the basic item pool, and administered to a sample of 97 flight instructors in primary flight training. The results of this investigation indicated that the recurring student errors within the spin maneuver could be isolated using this type of approach. Further, the definitions for the terms basic airwork, headwork and procedures and what constitutes a critical error were set forth. Author (GRA)

N74-12807# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

LLNO MEDICAL EVAC HUMAN FACTORS ANALYSIS Final Report

James R. Peterson and James W. Wingert 1 Feb. 1973 122 p refs

(Contract N00014-69-C-0460; NR Proj. 213-072)

(AD-767070; HONEYWELL-12609-FR1; JANAIK-730704) Avail: NTIS CSCL 15/7

The report presents the results of a study to support the preliminary System Synthesis task of the Low Level Night Operations (LLNO) program, as it applies to LLNO Search and Rescue and LLNO Medical Evacuation Missions. The study consisted of analytic studies of human factors problems. Recommendations are made for displays and controls and for a layout in the helicopter cockpit. Author (GRA)

N74-12808# Naval Air Development Center, Warminster, Pa. Crew Systems Dept.

PROBLEMS OF HIGH ALTITUDE AND HIGH SPEED EJECTIONS Final Report

Thomas J. Zenobi 30 Jul. 1973 46 p refs

(AD-767321; NADC-73001-40) Avail: NTIS CSCL 06G

High speed ejections and high altitude ejections pose severe problems for the crewman ejection seat system. Ejection seat systems need to be upgraded to satisfy these escape conditions for new generation high performance aircraft. Windblast, deceleration, temperature extremes, stabilization, oxygen deficiency and pressure change are problems to be considered. Some of these problems are common with present ejection seats also, but they become more severe for conditions of higher speeds and higher altitudes. Development is being conducted in some of the problem areas; however, in other areas development must be undertaken to achieve the results desired by this project. Author (GRA)

N74-12809# Research Inst. of National Defence, Sundbyberg (Sweden).

WAYS OF REDUCING THE RISKS OF ACCIDENTS [VAEGAR ATT MINSKA OLYCKSRISKER]

Stig Ek Mar. 1972 28 p In SWEDISH

(FOA-1-A-1550-D1) Avail: NTIS HC \$3.50

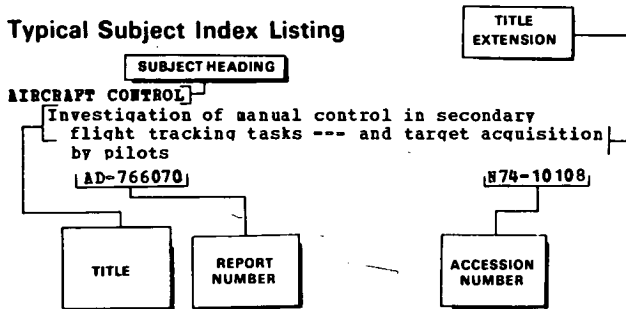
The possibilities of reducing accident risks by research, training and different feed back systems are discussed. The limits of overcoming accidents by pure statistics are analyzed. Combinations of protection systems are discussed. A means of improving information on how accidents happen is necessary for rational procedures. Technology must be adopted to the human as much as possible and to his natural reactions to create a human environment. A long term objective is probably to work out an intimate integration of man and technology with the help of measuring techniques and advanced treatment of data. Particularly dangerous processes will be remote controlled and automated. Author

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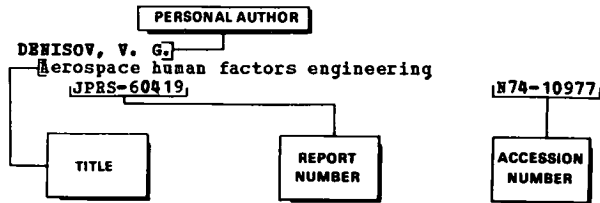
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Ballistocardiography: Research and computer diagnosis; Proceedings of the Sixteenth Annual Meeting, Atlantic City, N.J., April 29, 1972
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DEB aviation medical research unit reports, volume
3, 1971 - 1973
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Teleoperators and EVA for Shuttle missions
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Human Factors Society, Annual Meeting, 17th, Washington, D.C., October 16-18, 1973, Proceedings
A74-14585
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DRB aviation medical research unit reports, volume 3, 1971 - 1973
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1. Report No. NASA SP-7011 (126)		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography (Supplement 126)				5. Report Date March 1974	
				6. Performing Organization Code	
7. Author(s)				8. Performing Organization Report No.	
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546				10. Work Unit No.	
				11. Contract or Grant No.	
12. Sponsoring Agency Name and Address				13. Type of Report and Period Covered	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract <p style="text-align: center;">This special bibliography lists 400 reports, articles, and other documents introduced into the NASA scientific and technical information system in February 1974.</p>					
17. Key Words (Suggested by Author(s)) Aerospace Medicine Bibliographies Biological Effects				18. Distribution Statement Unclassified - Unlimited	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 114	
				22. Price* \$4.00 HC	

* For sale by the National Technical Information Service, Springfield, Virginia 22151



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